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JOURNAL of the American Veterinary Medical Association

FORMERLY
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CONVENTION NUMBER

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JOURNAL

OF THE

American Veterinary Medical Association

FORMERLY AMERICAN VETERINARY REVIEW

(Original Official Organ U. S. Vet. Med. Ass'n.)

H. Preston Hoskins, Secretary-Editor, 735 Book Building, Detroit, Mich.

L. A. MERILLAT, President, Chicago, Ill. M. JACOB, Treasurer, Knoxville, Tenn.

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Vol. LXVII, N. S. Vol. 20 July, 1925 No. 4

ON TO PORTLAND

For the first time in the history of our Association, we are going to visit the great Pacific Northwest. The veterinarians in that territory have been planning for our coming for a long time. The great distance to be travelled by the majority of our members will keep down the attendance figures, but what the meeting will lack in numbers will be more than offset by the high quality of the program, and the enthusiasm of our hosts and their guests.

On the following pages will be found an outline of the program, with a list of the papers and clinical demonstrations tentatively arranged. You will receive your copy of the official program shortly after the receipt of this issue of the JOURNAL. You will no doubt be impressed by the large number of papers and demonstrations listed. We believe that this program surpasses that of any previous year, in size, interest, and scope.

Quite a number of the subjects to be presented at Portland are peculiar to the Northwest. For example, salmon poisoning of dogs is probably not encountered elsewhere. Enzootic hepatic cirrhosis is the scientific appellation for so-called "walking disease" of horses, found in eastern Washington. Algae poisoning is another condition peculiar to the Northwest, seen in British Columbia. Ictero-hemoglobinuria of cattle, a disease found in

parts of Nevada, California and Oregon, will be discussed. The handling of tuberculosis under western conditions will be presented by four contributors to the program. Tick paralysis, another condition peculiar to the Northwest, is on the list of papers.

For the first time the small animal practitioners will meet as a regularly constituted section of the Association. The future of this section will be largely determined by the support given the section officers, Drs. E. A. Ehmer and J. C. Flynn, by the men interested in small animal work. A pretentious but well-balanced program has been arranged for the customary two sessions, with clinical demonstrations on Friday.

The program is given somewhat of an international flavor by several of the other papers. Dr. C. M. Haring, just back from a year spent in Europe, will present his observations on various phases of veterinary research in a number of the European countries he visited. Dr. Hugo Hartnack, of New York City, will explain the present-day status of the veterinarian in Germany. Dr. A. S. Schlingman, of Detroit, will give the results of his research on the organisms causing blackleg in South America, Europe and the United States. Dr. W. H. Boynton, now at the

Residence, Portland, Oregon. The Rose City.

University of California, will discuss rinderpest and how it is controlled in the Philippines.

Other timely subjects to be discussed are: Abortion, anthrax, arteriosclerosis, canine distemper, fowl pest, hog cholera, parasites and rabies; milk, meat inspection, glandular extracts, new operations, hospital management, canine dentistry, silver fox breeding, anatomy and castor oil. No one will be justified in complaining about insufficient variety. There will be something for everybody.

The ladies will have their program, as usual. The Women's Auxiliary will hold their annual session, and an extensive literary program has been arranged.

Portland—July 21-22-23-24—Plan To Go!

PORTLAND, THE CONVENTION CITY

The Rose City.
Population, 282,000.
Area, 70 square miles.
Paved streets, 355 miles.
Two-thirds of population American-born.
Water mains within city limits, 671 miles.
Annual average rainfall is less than 45 inches.
The world's greatest lumber manufacturing city.
Portland has 195 miles of electric street railways.
Portland ships more hops than any city in the world.
Wool exports largest of any city on the Pacific Coast.
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The Columbia River Highway is reached by auto from Portland. It is said to be without a scenic equal anywhere.

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OUTLINE OF PROGRAM

TUESDAY, JULY 21, 1925

MORNING —Opening session. Address of welcome. Response. President's address.
AFTERNOON—General session. Reports of Executive Board and officers.
EVENING —Meetings of college alumni associations.

WEDNESDAY, JULY 22, 1925

MORNING —Sectional meetings. Papers.
AFTERNOON—General session. Reports of Executive Board and Committees. Election of officers.
EVENING —General session. Papers only.

THURSDAY, JULY 23, 1925

MORNING —Sectional meetings. Papers.
AFTERNOON—Trip up Columbia River Highway.
EVENING —Banquet, President's reception, etc.

FRIDAY, JULY 24, 1925

MORNING —General session. Reports of Executive Board and Committees. Unfinished business. New business. Installation of officers.
AFTERNOON—Clinic.
EVENING —Open.

SATURDAY, JULY 25, 1925

MORNING —Trip to Seaside.

PAPERS

SECTION ON GENERAL PRACTICE

First Session

Wednesday Morning, July 22, 1925

"The Effect on Live Stock of Water Contaminated with Fresh Water Algae," Dr. W. Graham Gillam, Practitioner, Cloverdale, B. C.

"Fowl Pest," Dr. E. L. Stubbs, Pennsylvania Bureau of Animal Industry, Harrisburg, Pa.

"Enzootic Hepatic Cirrhosis," Dr. J. W. Kalkus, Western Washington Experiment Station, Puyallup, Wash.; H. A. Trippeer and J. R. Fuller, Practitioners, Walla Walla, Wash.

"The Influence of Diet in Hog Cholera Immunization Breaks," Dr. Robert Jay, Practitioner, Sacramento, Calif.

Second Session

Thursday Morning, July 23, 1925

"Case Reports on the Use of Oestrual Hormone and Other Gland Extracts in the Treatment of Functional Sterility," Drs. H. S. Murphey, G. W. McNutt, B. A. Zupp, and W. A. Aitken, Iowa State College, Ames, Iowa.

"Possibilities and Limitations of Ovary and Testicle Transplantation in Veterinary Practice," Dr. C. M. Haring, University of California, Berkeley, Calif. (Illustrated).

"Some Accidents I Have Met with in the Treatment of Sterility in Dairy Cattle," Dr. E. A. Schmoker, Carnation Milk Farms, Carnation, Wash.

"Laparotomy in the Cow." Dr. J. N. Frost, New York State Veterinary College, Ithaca, N. Y.

SECTION ON SMALL ANIMAL PRACTICE

First Session

Wednesday Morning, July 22, 1925

"Abdominal Surgery," Dr. Wm. M. Bell, Practitioner, Nashville, Tenn. Discussion by Dr. H. E. Kingman, Professor of Surgery, Colorado Agricultural College, Fort Collins, Colo.

"Canine Dental Surgery," Dr. C. A. White, Practitioner, Los Angeles, Calif. Discussion by Dr. R. C. Moore, St. Joseph, Mo.

"Salmon Poisoning in Dogs," Dr. C. R. Donham, Instructor in Veterinary Medicine, Oregon Agricultural College, Corvallis Ore.

"Practical Feed and Feeding of the Canine and Feline," Dr. H. W. Brown, Practitioner, Portland, Ore. Discussion by Drs. R. A. Button, Tacoma, Wash., and Otto Ruehle, Portland, Ore.

"Hospital Sanitation," Dr. J. F. McKenna, Practitioner, Fresno, Calif. Discussion by Dr. C. H. Seagraves, Practitioner, Astoria, Ore.

"Hospital Arrangement and Management," Dr. Horst Schreck, Practitioner, Portland, Ore. Discussion by Dr. J. M. Arburua, Practitioner, San Francisco, Calif.

"The Silver Fox," Dr. H. M. Beckman, Practitioner, Spokane, Wash. Discussion by Drs. V. R. Cline, Practitioner, St. Petersburg, Alaska, and E. A. Ehmer, Practitioner, Seattle, Wash.

DR. E. R. STEEL
Practitioner
Grundy Center, Iowa
Chairman
Section on General
Practice

DR. L. A. WRIGHT
Practitioner
Columbus, Wis.
Secretary
Section on General
Practice

SECOND SESSION

Thursday Morning, July 23, 1925

"Diseases Affecting the Central Nervous System of the Canine and Feline," Dr O. V Brumley, Professor of Veterinary Surgery and Director of Clinics, Ohio State University, Columbus, Ohio. Discussion by Dr. W. E. Frink, Practitioner, Los Angeles, Calif.

"Different Forms of Canine Distemper; Symptoms and Treatment," Dr. G. W. Closson, Practitioner, Hollywood, Calif. Discussion by Dr. C. R. Walter, Practitioner, Tulsa, Okla.

"Prophylactic Immunization of Dogs Against Rabies by a Single Injection of Dead-Virus Vaccine," Dr. A. S. Schlingman, Medical Research Laboratories, Parke, Davis & Co., Detroit, Mich. Discussion by Dr. Thos. H. Edwards, Practitioner, Pasadena, Calif.

"Results of the Fourteen-Dose Anti-Rabic Treatment Administered to 150 Dogs," Drs. R. P. Marsteller and A. A. Lenert, Texas A. & M. College, College Station, Tex. Discussion by Dr. Frank Breed, Pathologist, Jensen-Salsbery Laboratories, Kansas City, Mo.

DR. J. C. FLYNN
Practitioner
Kansas City, Mo.
Secretary
Section on Small
Animal Practice

DR. E. A. EHMER
Practitioner
Seattle, Wash.
Chairman
Section on Small
Animal Practice

"Internal Parasites of the Canine and Feline," Dr. F. D. Patterson, Jr., Professor of Veterinary Medicine, Alabama Polytechnic Institute, Auburn, Ala. Discussion by Dr. A. T. Kinsley, Pathologist, Kinsley Laboratories, Kansas City, Mo.

"Parasitic and Non-Parasitic Diseases of the Ears of the Canine and Feline," Dr. Frederick R. Whipple, Practitioner, Peoria, Ill. Discussion by Dr. J. L. McGrath, Practitioner, Pittsburgh, Pa.

"Castor Oil, Dr. O. M. Longley, Practitioner, San Francisco, Calif. Discussion by Dr. Hamlet Moore, Practitioner, New Orleans, La.

SECTION ON EDUCATION AND RESEARCH

First Session

Wednesday Morning, July 22, 1925

"Practical Results of Attempts to Control Abortion Disease," Drs. B. T. Simms and F. W. Miller, Oregon Agricultural College, Corvallis, Ore.

"Recent Studies on Ictero-hemoglobinuria of Cattle," Drs. Edward Records and L. R. Vawter, University of Nevada, Reno, Nev.

DR. F. M. HAYES
University Farm
Davis, Calif.
Chairman
Section on Education
and Research

ER. E. M. PICKENS
University of Maryland
College Park, Md.
Secretary
Section on Education
and Research

"A Comparison of the Causative Organisms of La Mancha, Manqueira, European and American Blackleg," Dr. A. S. Schlingman, Medical Research Laboratories, Parke, Davis & Co., Detroit, Mich.

"Infectious Bronchitis of Fowls," Dr. J. R. Beach, University of California, Berkeley, Calif.

"The Significance of *Bacillus Bronchisepticus* in Canine Distemper," Dr. J. G. Hardenbergh, The Mayo Foundation, Rochester, Minn.

"Arteriosclerosis in Domestic Animals," Dr. S. A. Goldberg, New York State Veterinary College, Cornell University, Ithaca, N. Y.

SECOND SESSION

Thursday Morning, July 23, 1925

"The Veterinarian, Society and the College," Dr. E. E. Wegner, State College of Washington, Pullman, Wash.

"Some Observations on Veterinary Research in Europe," Dr. C. M. Haring, University of California, Berkeley, Calif.

"Veterinary Medicine and Veterinarians in Germany: Education, Practitioners, State Veterinarians, and Sanitary Veterinarians," Dr. Hugo Hartnack, Winthrop Chemical Company, New York, N. Y.

"Conspicuous Achievements in Preventive Medicine," Dr. George H. Glover, Colorado Agricultural College, Fort Collins, Colo.

"Relation of the Thoracic Limb to the Thorax in the Case of the Horse and Ox," Dr. J. D. Grossman, Ohio State University, Columbus, Ohio.

SECTION ON SANITARY SCIENCE AND POLICE

FIRST SESSION

Wednesday Morning, July 22, 1925

"Tuberculin Testing on the Western Range," Dr. S. O'Toole, Chief, Tuberculosis Control, California Department of Agriculture, Sacramento, Calif.

"County Herd Inspection Work in Oregon," Dr. W. H. Lytle, State Veterinarian, Salem, Ore.

"Tuberculosis Eradication in the Northwest," Dr. Samuel B. Foster, B. A. I. Inspector-in-Charge, Tuberculosis Eradication Division, Portland, Ore.

"Teat Lesions in Cows Reacting to the Tuberculin Test," Dr. Hadleigh Marsh, Montana Livestock Sanitary Board, Helena, Mont.

"The Relation of Avian to Porcine Tuberculosis," Drs. Robert Graham, I. B. Boughton and E. A. Tunnicliff, University of Illinois, Urbana, Ill.

SECOND SESSION

Thursday Morning, July 23, 1925

"State Meat Inspection," Dr. J. P. Iverson, Chief, Division of Animal Industry, Sacramento, Calif.

"Tick Paralysis," Dr. E. A. Bruce, Department of Agriculture, Agassiz, B. C.

"New Phases in Anthrax Vaccination," Dr. A. Eichhorn, Lederle Antitoxin Laboratories, Pearl River, N. Y.

"Contagious Abortion," Dr. M. F. Barnes, Pennsylvania Bureau of Animal Industry, Harrisburg, Pa.

"Milk," Dr. E. A. Schmoker, Carnation Milk Farms, Carnation, Wash.

GENERAL SESSION

Wednesday Evening, July 22, 1925

"The Prevention of Losses in Live Stock During Shipment," Dr. W. J. Embree, Chief Veterinarian, Western Weighing and Inspection Bureau, Chicago, Ill. (Illustrated).

Address: Mr. Sydney H. Coleman, The American Humane Association, Albany, N. Y.

DR. ORLAN HALL
Dept. of Agriculture
Ottawa, Canada
Chairman
Section on Sanitary
Science and Police

Address: Mr. O. M. Plummer, Secretary and General Manager, Pacific International Live Stock Exposition Company, Portland, Ore.

"Fowl Pest," Dr. John R. Mohler, Chief, U. S. Bureau of Animal Industry, Washington, D. C.

"The Control of Rinderpest," Dr. W. N. Boynton, University of California, Berkeley, Calif.

CLINICAL DEMONSTRATIONS

Friday Afternoon, July 24, 1925

Postmortem Technic—Dr. N. G. Covington, Auburn, Ala.

The Intubation Method for Administering Ether in Canine Surgery—Dr. J. G. Hardenbergh, Rochester, Minn.

X-ray, Bronchoscope and Gastroscope Demonstrations—Dr. F. R. Whipple, Peoria, Ill.

Abdominal Surgery—Dr. Wm. M. Bell, Nashville, Tenn.

Splinting with Yucca Board—Dr. E. A. Ehmer, Seattle, Wash.

Walking Disease of Horses—Drs. J. W. Kalkus, Puyallup, Wash.; C. W. Lassen, Pendleton, Ore.; H. A. Trippeer, Walla Walla, Wash.

Catheterization of a Bull—Dr. E. E. Wegner, Pullman, Wash.

Deficiency Diseases of Fowls—Dr. J. R. Beach, Berkeley, Calif.

Poultry Diseases—Dr. W. T. Johnson, Puyallup, Wash.

Restraint of and Administration of Medicine to Sheep—Dr. E. T. Baker, Moscow, Idaho.

Exhibit and Autopsy of Pneumonia in Sheep—Dr. Hadleigh Marsh, Helena, Mont.

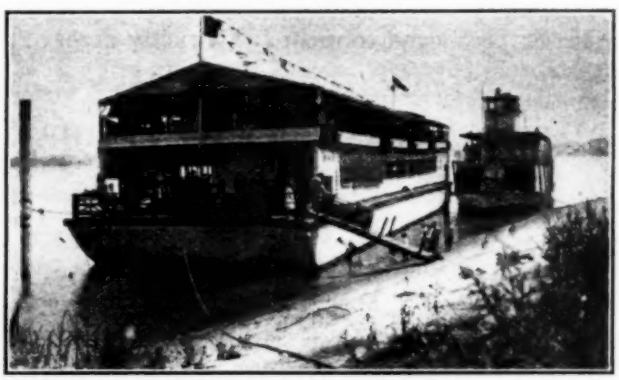
Udder and Foot Operations in Cattle and Operation for Hygroma of Carpus in the Cow—Dr. J. N. Frost, Ithaca, N. Y.

Rumenotomy—Dr. R. R. Dykstra, Manhattan Kans.

New Method of Treatment for Actinomycosis—Dr. W. H. Lytle, Salem, Ore.

Otitis Media, Castration, Hernia Operation and Passing the Stomach-Tube in Swine—Dr. W. F. Guard, Ames, Iowa.

Portland Awaits Your Coming



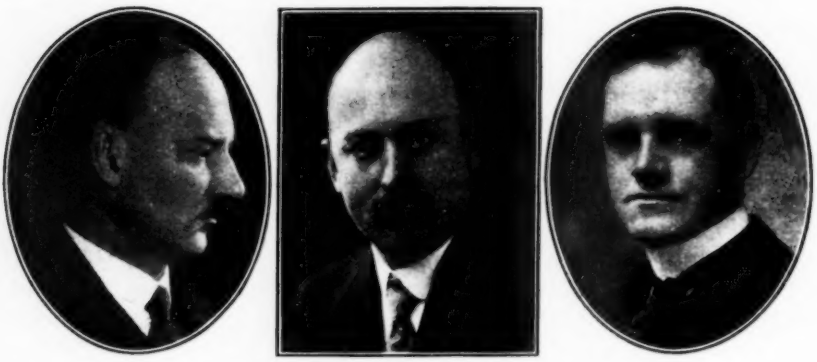
"The Swan" of Portland, Oregon.

HONORS RICHLY DESERVED

Three members of the American Veterinary Medical Association, all connected with the U. S. Bureau of Animal Industry, at Washington, received the honorary degree of Doctor of Science at commencements held during June.

Dr. John R. Mohler, Chief, Bureau of Animal Industry, was so honored by his Alma Mater, the University of Pennsylvania.

Dr. Brayton H. Ransom, Chief, Zoological Division, B. A. I., honored by his Alma Mater, the University of Nebraska.



HONORED BY THEIR ALMA MATERS
Left to right: Brayton H. Ransom, B. S., M. A., Ph. D., D. Sc.; John R. Mohler, A. M., V. M. D., D. Sc.; Maurice C. Hall, B. S., M. A., Ph. D., D. V. M., D. Sc.

Dr. Maurice C. Hall, Zoologist, Zoological Division, B. A. I., honored by his Alma Mater, Colorado College.

Well done, good and faithful servants. Not only has our live stock industry profited immeasurably through your unselfish labors, but your scientific accomplishments have contributed much to the safety and well-being of mankind. It is intensely gratifying to be privileged to record this richly deserved recognition.

APPLICATIONS FOR MEMBERSHIP

(See April, 1925 JOURNAL)

FIRST LISTING

ALLEN, JAMES S. Nampa, Idaho
D. V. M., Chicago Veterinary College, 1920
Vouchers: W. A. Sullivan and W. E. Neary.

CULLEN, J. T. 634 Exchange Bldg., South St. Paul, Minn.
D. V. M., Ohio State University, 1910
Vouchers: G. E. Totten and Irvin Owens.

GREEN, H. H. c/o State Veterinarian, Salem, Ore.
D. V. M., Washington State College, 1919
Vouchers: B. T. Simms and W. H. Lytle.

HOAG, L. DALE — Manson, Iowa
D. V. M., Iowa State College, 1925
Vouchers: W. F. Guard and C. H. Stange.

JACOBSON, OLENE — Jewell, Iowa
D. V. M., Iowa State College, 1925
Vouchers: W. F. Guard and C. H. Stange.

JAGGER, THOMAS HENRY — 344—8th Ave. W., Vancouver, B. C.
B. V. Sc., Ontario Veterinary College, 1910
Vouchers: E. A. Bruce and J. G. Jervis.

KEOWN, JAMES HENRY — 1100 Pandora St., Victoria, B. C.
V. S., Ontario Veterinary College, 1907
Vouchers: E. A. Bruce and J. G. Jervis.

KOTLAN, ALEXANDER — Michigan State College, E. Lansing, Mich.
D. V. M., Royal Hungarian Veterinary College, 1911
Vouchers: Ward Giltner, H. J. Stafseth and B. J. Killham.

MYERS, FRED CHARLES — 100 Madison St., Corvallis, Ore.
D. V. M., Colorado Agricultural College, 1924
Vouchers: Thomas B. Carter and Chas. R. Donham.

PATTERSON, JAMES EBERLE — 3800 Grand River Ave., Detroit, Mich.
B. V. Sc., Ontario Veterinary College, 1925
Vouchers: E. E. Patterson and H. Preston Hoskins.

PETERSON, H. D. — 214 Clay St., Dallas, Ore.
D. V. M., San Francisco Veterinary College, 1918
Vouchers: Thomas B. Carter and Horst Schreck.

REDDEN, C. E. — 649 N. Robert St., St. Paul, Minn.
D. V. M., Kansas City Veterinary College, 1915
Vouchers: G. E. Totten and Irvin Owens.

RIVERA, ALFONSO — Box 136, Hato Rey, Porto Rico.
D. V. S., United States College of Veterinary Surgeons, 1912
Vouchers: Jaime Bagué and H. Preston Hoskins.

RODE, WALTER F. — 400 Exchange Bldg., South St. Paul, Minn.
D. V. M., McKillip Veterinary College, 1913
Vouchers: G. E. Totten and Irvin Owens.

STANTON, L. E. — Box 102, Owatonna, Minn.
D. V. M., Iowa State College, 1925
Vouchers: W. F. Guard and C. H. Stange.

WHIPPLE, FREDERICK RANDOM — 408 No. Adams St., Peoria, Ill.
M. D. V., McKillip Veterinary College, 1902
Vouchers: L. A. Merillat and E. L. Quitman.

WHITE, EDWARD H. — Hickory, Pa.
D. V. M., Iowa State College, 1925
Vouchers: W. F. Guard and C. H. Stange.

WHITEHILL, NELSON HALL — 107—2nd St. N. W., Washington, D. C.
D. V. M., United States College of Veterinary Surgeons, 1918
Vouchers: A. M. Farrington and John R. Mohler.

APPLICATIONS PENDING

SECOND LISTING

Clemens, Nelson E., 183 Castro St., Hayward, Calif.
Creely, Andrew J., c/o Boise Butcher Co., Boise, Idaho.
Davidson, O. G., 2226 Oakland Drive, Kalamazoo, Mich.
Harden, James H., 129 No. 3rd St., Brooklyn, N. Y.
Hartnack, Hugo, Winthrop Chemical Co., 80 Varick St., New York, N. Y.
Hines, George H., Hume, Ill.
Hughes, James Whildin, Ammendale, Md.
Hull, Floyd E., 1212 Morgan Ave., Downs, Kans.
Menendez (Guillot), Francisco, P. O. Box 819, San Juan, P. R.
Saxe, David M., 21 N. Virginia Ave., Atlantic City, N. J.
Schmille, H. F., Westboro, Mo.

COMING VETERINARY MEETINGS

Kentucky Veterinary Medical Association. Glasgow, Ky. July 8-9, 1925. Dr. J. A. Winkler, Secretary, Newport, Ky.

Illinois State Veterinary Medical Association. Peoria, Ill. July 8-9, 1925. Dr. L. A. Merillat, Secretary, 1827 So. Wabash Ave., Chicago, Ill.

Virginia State Veterinary Medical Association. Charlottesville, Va. July 9-10, 1925. Dr. W. H. Ellett, Secretary, Medlothian, Va.

New Jersey, Veterinary Medical Association of. Asbury Park, N. J. July 9-10, 1925. Dr. G. P. Ellice, Secretary, Rutherford, N. J.

Maryland State Veterinary Medical Association. Frederick, Md. July 9-10, 1925. Dr. E. M. Pickens, Secretary, College Park, Md.

Missouri Valley Veterinary Association. Omaha, Nebr. July 13-14-15, 1925. Dr. E. R. Steel, Secretary, Grundy Center, Iowa.

South Carolina Association of Veterinarians. Greenwood, S. C. July 14-15, 1925. Dr. M. R. Blackstock, Secretary, Spartanburg, S. C.

Wisconsin Veterinary Medical Association. Eau Claire, Wis. July 14-15-16, 1925. Dr. O. H. Eliason, Secretary, 226 W. Gilman St., Madison, Wis.

Western New York Veterinary Medical Association. Gowanda, N. Y. July 15, 1925. Dr. F. F. Fehr, Secretary, 243 South Elmwood Ave., Buffalo, N. Y.

Minnesota State Veterinary Medical Association. University Farm, St. Paul, Minn. July 15-16, 1925. Dr. C. P. Fitch, Secretary, University Farm, St. Paul, Minn.

North Dakota Veterinary Medical Association. North Dakota Agricultural College, Agricultural College, N. D. July 16-17, 1925. Dr. R. S. Amadon, Secretary, Agricultural College, N. D.

Montana Veterinary Medical Association. Helena, Mont. July 17-18, 1925. Dr. Hadleigh Marsh, Secretary, Helena, Mont.

Colorado Veterinary Medical Association. Pueblo, Colo. Aug. 11-12, 1925. Dr. A. G. Fisk, Secretary, Greeley, Colo.

American Veterinary Medical Association. Portland, Ore. July 21-22-23-24, 1925. Dr. H. Preston Hoskins, Secretary, 735 Book Bldg., Detroit, Mich.

FOX FARMING AND ITS VETERINARY PROBLEMS

By J. A. ALLEN

Charlottetown, Prince Edward Island

Pathologist in Charge, Fox Research Station,
Health of Animals Branch, Canada

My presenting this paper before the general session of the meeting of this Association is not purely accidental. I fancy the Secretary had some difficulty in deciding to which section my subject properly belonged, and the natural way to solve it was to place me among the unclassified. I venture the prophecy that, in future generations, the secretaries then in office will have no such trouble in assigning a position to similar subjects as mine, for general fur-farming will then have reached such magnitude that a meeting of a body like this will be considered incomplete without a section devoted to domesticated fur-bearing animals.

THE DEVELOPMENT OF FOX RANCHING

The men who gave birth to this new industry laid no claim to a knowledge of the biological principles underlying their venture. They were men with simple love for the outdoor life, and who devoted considerable time to trapping. They realized that when fortune brought the rare silver or black fox to the trap that the market returned $100.00 or more for every dollar received for the pelt of the commoner red variety. This simple fact was doubtless the main force in determining commercialized conservation, if I may coin that phrase. It cannot be gainsaid that the successful domestication of useful wild animals is an important factor in conservation.

Silver foxes were scarce, and the market price of their pelts was high. Now the advantages of perpetuating these rare specimens are obvious. Dalton, Oulton, Raynor and Champion, of Prince Edward Island, Canada, were among the first to devote their attention to this absorbing and interesting task. Success did not come immediately, but the obstacles were gradually overcome and these early experiments resulted eventually in successfully breeding silver foxes, true to type, in captivity.

In these early days the industry was closely guarded and enveloped in secrecy. A compact existed between the few interested,

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and no live stock was sold, until this arrangement was broken in 1910 or thereabouts. This was a signal for the eventful boom. The pioneers could no longer conceal the fact that they were making handsome profits from the sale of the pelts of farm-bred black foxes and there started a scramble to get possession of foundation stock, which resulted in soaring prices, until 1913, when $16,000 was demanded for an average pair of foxes. The bubble burst at the beginning of the European war, and the industry received a severe jolt, from which it has made remarkable recovery, especially since the cessation of hostilities in Europe.

Fox farming has weathered these early trying experiences and today is on a substantial commercial foundation. Foxes are sold for practically what their pelts will bring. As evidence that the industry has made great strides within the last few years, it is estimated that in 1912 there were not more than ten ranches operating in Canada, while today the number is officially placed at 3,900. The growth of the industry in the United States is also astonishing. The Bureau of Biological Survey estimates that there are 800 fox ranches, having in all from 12,000 to 15,000 foxes in captivity. The figures quoted above for Canada probably include the farmer who has one or two pairs, for the raising of a few pairs of foxes on the farm is becoming a common enterprise, the farm housewife devoting her attention to this, rather than to the more prosaic work of feeding chickens.

The Major Problems of Fox Ranching

The problems came as a natural sequence to the development of the industry. In the early days, when only comparatively few foxes were herded together, the dangers were not so great, and their true significance was not recognized. Those interested, as previously stated, were engaged in a secret industry, consequently professional aid was not sought, nor was it available in every case. As the industry expanded, so also did the difficulties increase. When the war came, the market for pelts and live stock was automatically curtailed, which meant that many ranchers found it necessary to carry over foxes which would have been sold in normal times. Then more ranchers, having 50 to 100 pair and their progeny, began to appear.

It was at this stage of development that the more progressive fox ranchers realized that scientific assistance should be called to help them, and as a result of these representations, the Health of Animals Branch, Dominion Department of Agriculture, in

1918, decided to make a preliminary survey for the purpose of determining the nature of the problems. This was the nucleus for the first Fox Research Station. The work was attended with great difficulty, as there was practically no distinctive literature to serve as a guide. It was therefore practically a virgin field. Since then we have published a number of popular and scientific articles dealing with the problems encountered.

In considering the problems of fox farming, it is well to realize that the taking of a wild animal and successfully raising and breeding that animal in captivity is in itself an important achievement. Indeed, it is a remarkable tribute to the flexibility of nature. One would naturally look for biological difficulties, and it is astonishing that the mortality is not greater in view of the conditions under which foxes are kept. The raising of foxes today, in suitable localities, is not any more hazardous than is the raising of some of the more common live stock, provided, of course, that the laws of sanitation are not too flagrantly violated.

Fox Pup Mortality

It can be said, with little qualification, that the chief problems are those which must follow congestion and the consequent insanitation. It may be stated as an axiom that in nature the fox has not nearly the same chance of fouling the ground, and his associates have not the same chance of coming in contact with his excretions as when such an animal is penned up with several of his fellows in a small enclosure. Fox breeders have tried to copy nature or natural environment without making due allowance for the potential dangers of congestion.

It is a soundly established fact that the young of any species is particularly susceptible to an unclean environment. There is a tradition among practical fox ranchers that interference during the period, from mating to a month or so after whelping, is likely to cause the parents either to miscarry or destroy their young, so that fox kennels are not cleaned in the majority of cases from the beginning of the month of December until the end of April, or later. Is it any wonder that most young foxes become infested with intestinal parasites? Even if the parents have only a few worms, there is a constant accumulation of eggs, and some of these are taken in with the first suckle.

Another contributory factor in these early losses is the indiscriminate administration of worm remedies to fox pups when they have reached the age of three or four weeks. Ascarid infes-

tation is so rampant that few pups escape this treatment whether they have the worms or not. For the present this universal medication for worms must be regarded as a necessary evil, but it should be remembered that nearly all such remedies that are efficacious in dispelling worms are more or less poisonous, and the zone between the comparatively safe medicinal dose and the poisonous dose is so narrow, in some cases, that there is grave danger in the indiscriminate use of them, especially in the case of very young animals.

In some few experiments we have produced toxic symptoms and even caused death with very minute doses of chenopodium, and as this is the active principal in most of the commercial remedies given to fox pups, I fear that much damage is done as the result of intoxication and the consequent intestinal disorders. In some cases the dosage is so minute that their efficacy is questionable, and it will remain so until some critical experimentation has been conducted. There are a number of difficulties in the way of getting this information. Foxes are so valuable that it is difficult to obtain sufficient experiment material, and it is almost impossible to separate young pups long enough to recover the worms that are voided and if they are left with the parents, the old foxes will devour the worms as they are passed, thus spoiling the evidence.

External Parasites

Mange: Sarcoptic mange is of rare occurrence in Canadian foxes in captivity for, as far as we know, there is only one authentic report of this disease. It is said to be fairly prevalent elsewhere. Occasionally one sees a fox (infested with ear mites) with crusts below the ears and the lower portion of the neck. This is the result of the continual scratching in the vain attempt to remove the mites from the concha and the external auditory canal. In one case I have demonstrated the presence of ear mites in these crusts. The thought occurred to me that a similar experience would be apt to mislead one not familiar with the anatomical differences of the parasites, so that these lesions might be mistaken for true scabies.

Auricular Scabies: This disease is particularly rampant in the ranch fox. We have demonstrated the presence of ear mites in nearly 100 per cent of the animals on certain ranches; and the infection appears to go in cycles, appearing some years with more frequency than others.

Symptoms: Foxes may be infested with these mites (*Otodectes cynotis*) without manifesting typical symptoms. They may be seen occasionally scratching the neck in the vicinity of the ear, but the indication of irritation is usually attributed to fleas, which in a good many instances are present also.

Before we undertook our investigations the presence of this parasite was not suspected. I observed it in so many cases in which there was no apparent damage done that I failed to attach any great importance to the infection. However, further experience with the disease has fully demonstrated that ear mites are decidedly harmful to the ranch fox.

This scratching, which is more apt to be noticed at dusk or at night, especially if the observer's presence is not known, as foxes do not usually betray symptoms when they know they are being watched, may be seen so infrequently that the disease may pass unperceived. But if the concha be closely examined an abundance of greyish, flaky or scaly material can be readily seen, and if a small portion of it be placed in a glass vial or upon a piece of black paper the mites may be observed as small, greyish, moving points, with the naked eye. The structure of the acarus, of course, can best be seen and studied under the microscope.

It is these benign manifestations, as previously stated, that have misled us in our interpretation of the seriousness of ear mite infestation. For some months there is nothing to distinguish the diseased from the healthy fox in the pen. Indeed, an infested fox may go through life without going beyond the scratching stage but, in a good many cases, the graver symptoms develop rapidly, often over night. These are usually first ushered in by an epileptiform seizure; the animal will rush about the pen, collide with obstacles, and climb the wire sides of the enclosure. At other times he will travel incessantly in circles, usually in the direction in which the head is twisted, until he is exhausted. If he is made to turn in the opposite direction he cannot go more than a few steps without falling, and after he has risen he will resume his former course.

We had one fox at our Experiment Station that made an almost mathematically accurate circle night and day for fourteen days. When the disease has reached this stage, the head is nearly always twisted to one side, and I have seen cases where the neck was twisted to such a degree that the head was carried upside down, the lower jaw being uppermost. The eyes assume a glary look, and appear in some cases to be protruding from their

sockets. The affected fox is so stupefied and blind that he cannot see the feed-dish, but if it is pressed close to his mouth he will often eat ravenously. There may or may not be a catarrhal discharge from the ears. The animals may die in one of these fits, or recovery from the acute symptoms may take place in from 15 to 30 days. However, in the majority of such cases, the head is permanently twisted and the injury to the typanum and internal structure of the ear causes a permanent deafness. Any undue excitement or shock may produce a recurrence of the disease; I have seen one such case die almost instantly when being dipped for fleas.

A fox may develop one of the convulsive seizures and die without being observed by the keeper, and I am convinced that this is a solution of some of the sudden deaths that are reported from time to time. In some autopsies of such cases we have failed to find any changes in the vital organs, the only evidence of disease being a catarrhal otitis, in which the mites and bacteria could be found. In the catarrhal exudate, however, the mites are not usually very numerous, but microorganisms, usually bacilli, are present in abundance.

I would not like, at this stage, to say definitely just how convulsive seizures are produced, but it is probable that the acari act as a constant and irritating stimulus to the nerves in the auditory canal. The role played by the bacteria present in nearly all cases of parasitic otitis is a matter for further research.

In the early stages of auricular scabies the treatment is very simple, as the mites are not very resistant to most insecticides. Among the remedies recommended are the following:

(Neumann)

Olive oil	100 gm.
Naphthol	10 gr.

(Hall)

Carbon tetrachlorid	1 part
Castor oil	3 parts

A simple solution that is fairly effective is:

Creolin	2 parts
Glycerin	10 parts
Water	88 parts

Another solution that has given me good results is:

Liquor cresolis compositus	20 cc
Glycerin	100 cc
Ether	100 cc
Distilled water	q. s. 1000 cc

This solution has the advantage of being comparatively clean to work with.

In describing the treatment of auricular scabies in other animals, the authorities usually recommend that the ear be thoroughly washed out with soap and water to remove the cerumenous matter before applying the remedy. I am of the opinion that the cleansing operation should follow the instillation of the insecticide as there is always the danger of driving the mites further into the auricular canal. My plan is to kill or render the parasite inactive as soon as possible, then to cleanse out the ear thoroughly with the aid of a pair of forceps and a pledget of absorbent cotton. By this means many of the eggs are removed. After cleansing, the ear is again filled with the solution so as to kill any of the mites that may have escaped the first application.

In severe cases, with convulsions and excitement, the object should be to rest the patient by quietness and sedatives. For the latter purpose I recommend the following:

Chloralhydrate	18 grains
Potassium bromid	1 dram
Syrup wild cherry	2 drams
Peppermint water q. s.	1 ounce

One to two drams, given every three hours, until the animal becomes quiet.

The patient must be hand-fed during the early stages of the acute symptoms.

Fleas

Ctenocephalus canis (Curtis 1826)

As would be expected, in view of the insanitary methods in vogue, fleas are particularly rampant in ranch-raised foxes. The long fur makes an ideal location for their propagation, and since they are to be regarded as blood-suckers, which produce much irritation, a heavily infested fox cannot be expected to thrive or produce fur of good texture.

Pups are treated with Dalmatian powder, spirits of camphor, etc. It is not advisable to dip young foxes in spring, though they may be safely dipped during July and August. A one per cent solution of creolin makes a very satisfactory dip. It is said that other common coal-tar products have, in weak solutions, a detrimental effect on the fur, causing it to become brownish instead of deep blue-black, but I believe that the evidence is not sufficient to warrant this unqualified condemnation.

The kennels and pens must be thoroughly disinfected at the same time. For this purpose we recommend a 4 per cent solution

of liquor cresolis compositus, and it should be allowed to act for at least eight hours, before finally scrubbing out with scalding water.

Common Internal Parasites

Ascarids: In Canadain foxes we have found three distinct species of ascarids: *Belascaris marginata, Toxascaris limbata* and *Belascaris cati.*

The usual habitat of these parasites is, of course, the small intestines, but in pups it is not unusual to find ascarids in the stomach, gall-bladder, and even in the liver. There seems little doubt but that the larvae invade the other tissues in the migration as we have observed them in the lungs.

We have observed ascarids in an advanced state of development in pups less than a week old, and the only tenable explanation of this phenomenon is prenatal infection.

In discussing the economic importance of ascarids and other internal parasites, we do not always recognize that ordinary intestinal worms, formerly considered of little importance, may cause much damage and even permanent injury before they reach their selective location in the body for development into adults. Their migration to delicate organs of young animals must be attended with grave consequences. The havoc thus wrought in young fox pups necessitates great demands on the natural repairing agencies of the body at the time when the body is least able to respond. Indeed, my observations lead me to suspect that this early infestation, if heavy enough, may leave a taint throughout the life of the host, and in it we have a possible and feasible explanation of poor quality and apparent nutrition defects that are too frequently evident in the ranch fox.

Ascarids are less commonly found and when present the infestation is seldom heavy in adult foxes. This comparative freedom is not due entirely to the efforts of the ranchers to rid the animals of worms in early life, but there is a decided indication that foxes are less susceptible to infection in later life, which is doubtless the result of a type of acquired immunity. This, I believe, holds true in the case of hookworms and lungworms also.

The symptoms of ascarid infestation in fox pups do not differ much from those described for other small animals. The young fox does not thrive well, and in some cases becomes stunted. The abdomen is distended, a condition usually described as "pot belly." There may be evidence of disordered digestion, such as irregular appetite, colic, diarrhea or constipation. The

coat has a rough appearance and infested young foxes are prone to convulsions, though some of these seizures, as pointed out before, may be induced by ear mites.

There is a tendency to regard the treatment of young foxes for roundworms as a settled question, but in my opinion it is a matter which requires much further research. The remedies commonly employed are commercial ones, and their efficiency has not, so far as I know, been checked by critical experimentation. If the rancher observes the passing of a few worms after treatment, he assumes that the remedy is efficient. Because of the difficulty of obtaining material to work upon, our experiments with anthelmintics for young fox pups are so few that we are not justified in drawing any definite conclusions from them.

Oil of chenopodium is an active principal in most of these capsules, and the dose must be very minute, or intoxication would occur with greater frequency. We have produced toxic symptoms with doses as small as one-half minim, and death with one minim, though the toxicity of this drug appears to be due to an individual intolerance. From one-eighth to one-quarter minim of chenopodium, given in castor oil, will remove some of the ascarids, and this dosage appears to be fairly safe, though its efficacy has never been checked by experimental methods. I have administered some of the common commercial capsules to kittens, at about the same age as fox pups are treated, with disastrous results, but of course it is recognized that cats are very susceptible to chenopodium poisoning.

One of the greatest problems is the early age at which it seems necessary to treat fox pups. A young delicate animal, four weeks old, is not likely to withstand very potent remedies.

In some cases of ascarid infestation, it is not unusual to find the whole intestinal canal, from stomach to rectum, completely packed with worms. In these cases treatment is difficult, as the minute quantity of the active agent comes in contact only with worms in the upper portion of the intestines. These are apt to form verminous knots, and cause grave intestinal disorders.

Deducting from analogies from our experimental experience with carbon tetrachlorid in the removal of ascarids and hookworms from adult foxes, we decided that we might find in this drug a suitable remedy for administration to pups. In these experiments we found that doses as small as three minims were not only inefficient but that the death rate from the drug was too high, being 14 per cent in the 145 pups treated.

Some of the other problems with which we meet will be discussed in a subsequent paper

SMALL ANIMAL PRACTICE*

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Twenty-five years ago the practice of veterinary medicine was confined principally to large animals and the horse was the animal that received the most attention. In later years this has been modified and we find the veterinarian devoting more time to other species, especially cattle, swine, dogs, cats and the various breeds of poultry. This change has taken place gradually until the past few years, when several things have occurred to bring about a more rapid change. Perhaps the one big factor has been the automobile and automotive truck, especially in the larger cities. Another important reason for this change is that people are becoming more attached to small animals and consequently there is a great increase in the number of dogs and cats that are kept simply for pleasure. This type of practice is very remunerative and it is pleasing to note that it is extending to smaller cities and rural communities.

What constitutes a small animal practice? We should include all the small domestic animals, particularly dogs, cats and poultry. In the cities, dogs and cats represent the majority of cases, while in rural communities, poultry predominates.

Equipment: Certain equipment is essential in small animal practice. A clean well equipped office should be provided. This should contain a waiting-room, similar to those used by physicians. This is a big aid in securing a high-class clientele. This should be provided with neat furniture, contain the current veterinary and agricultural literature and should be kept neat and clean. The cages for the animals should be well lighted and ventilated and must be kept clean at all times. A few isolation cages are necessary to house the contagious and infectious diseases. Finally, it is not possible to do satisfactory work in small animal practice without the use of a miscrocope.

Feeding: The feeding of small animals is very important. In many conditions, dieting is one of the most important things to be considered. Many animals suffer from too much food rather than an insufficient amount. A large number of cases need only restricting the diet for several days, while nourishing and con-

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centrated foods are required in animals recuperating from many diseases. Eggs, beef extract, salmon, lean meat, mush, oatmeal and milk constitute the common foods for weak and undernourished animals. The ordinary dog biscuit can be used as the basic food and other foods given as the case demands. Indiscriminate use of table scraps, trimmings from meat, garbage from restaurants, etc., is dangerous, due to preformed toxins, infections and foreign substances, which may produce very serious results.

The diet should be a mixed one in which all the essential food stuffs are duly represented. Meat may occasionally, under exceptional circumstances, be safely and wisely given as the exclusive diet. Usually it can be allowed only in limited quantity, but in no case must it be permanently withheld. Of all the cereals, wheat which is ground moderately fine and used in making bread, biscuits or porridge is best. Oatmeal and cornmeal are good, especially in winter. Milk is useful but not in large quantities at any one time, nor continuously.

Distemper

In a discussion of this kind, it is not feasible to discuss every condition which may occur, but the ones which are real problems and with which we are having the most trouble combating should be considered. With this in view, a discussion of one of the most troublesome conditions met with in the dog should be in order, namely, canine distemper.

This is an acute, infectious, communicable disease which in most cases affects young dogs, usually during the first year of life. It is one of the most common diseases and is found in all countries where dogs are found. It occurs in some districts as an enzootic and is more prevalent in cities than in the open country. Highly bred animals are more commonly affected than those bred by natural selection.

The cause of canine distemper is still debatable. Some claim it is caused by a specific microorganism, *Bacillus bronchisepticus*, while others believe it to be due to a filtrable virus. In each case, evidence has been produced which seems to substantiate the claim made. At the present time, a large sum of money is being expended in England to investigate this disease and we trust that something tangible may result. From a clinical standpoint, two distinctive factors are recognized: (1) a primary infectious agent which produces the initial symptoms, and (2) secondary

invading organisms which produce many varied and serious complicating conditions.

Nanural infection occurs in several ways. It may be either direct or indirect, the animals coming into immediate contact, or through intermediary agents. Puppies are especially susceptible, the disease occurring from three months to one year of age.

It is important to understand that many cases of distemper develop irregularly, this fact making it difficult to arrive at a positive diagnosis in the early stages. The outcome of the disease is not favorable even in milder forms and it is well to guard the prognosis in all cases.

Treatment: In the treatment of distemper, nursing plays a very important part. Easily digested and nourishing food must be given in order to maintain the patient's strength. The affected animal should be placed in a clean, uniformly warm place, should be protected from draughts and should be given concentrated nourishment. For this purpose, milk and strong meat broth, with the yolk of an egg beaten into it, are most suitable. In the presence of gastro-intestinal catarrh gruel may be given.

The medicinal treatment is mainly symptomatic. For depression and weakness, stimulation with camphorated oil is recommended. A combination of iodin, one part, camphor, three parts, and creosote, one and one-half parts, with glycerin as a base, is very efficient as a respiratory and intestinal antiseptic. When nervous symptoms are severe, anodynes and antispasmodics may be used.

The various sera and bacterins used for treatment in distemper are not very promising, as they are prepared with the aid of bacteria which are of importance only in secondary organic lesions. Some success from the administration of anti-distemper serum has been reported if given in the early stages, before the secondary lesions have occurred. It should be given in 20- to 30-cubic centimeter doses.

Immunization should be encouraged but the owner should be informed of the limitations of this treatment.

Gastro-enteritis

This is one of the very common diseases brought to the veterinary hospital for treatment. It is probably safe to state that about fifty per cent of canine cases treated by the small animal practitioner will be cases of gastro-enteritis.

This condition may be caused by error in diet, chemical substances, parasites, or it may occur secondary to other diseases.

Vomiting is one of the most common symptoms, the vomitus usually consisting of undigested and decomposed food material This may be streaked with blood. Diarrhea usually occurs, especially when the cause is a poison or a specific infection. Severe abdominal pain is a prominent symptom, the severity depending somewhat upon the cause and the temperament of the individual animal.

A chronic inflammation of the gastro-intestinal tract is of frequent occurrence, and is usually evidenced by loss of appetite and alternating constipation and diarrhea. General symptoms of dulness and gradual emaciation usually occur with this condition.

When a diagnosis is made and the cause determined, treatment should be applied to remove the cause and correct the condition. Good hygienic surroundings with sufficient warmth and ventilation to insure comfort should be provided. When due to toxic or irritating substances, the digestive tract should be emptied. Apomorphin, as an emetic, followed by castor oil, may be given, or the irrigation of the entire digestive tract with a two per cent solution of sodium bicarbonate may be tried. When diarrhea is persistent, sedatives and astringents are indicated. Cream or milk of bismuth is very satisfactory for this purpose. When the condition is due to specific infections, intestinal antiseptics should be used together with proper stimulation. Camphor, creosote and iodin, in combination, is recommended for this purpose. The diet must be given careful attention. All food should be withheld for a period of twenty-four to forty-eight hours, providing the patient is not in a too weakened condition. When food is given, it should consist of small amounts of finely prepared lean meat, meat broth, raw eggs or cooked rice. Milk and starchy foods must not be included in the diet, as they are difficult to digest, excite vomition and cause a continued general weakening of the patient.

Parasitism

Practically all dogs from puppyhood to maturity are infested at some time with parasites, either external or internal, but especially the latter. Of the internal parasites infesting dogs, the four species found in the intestinal tract are the most important.

Over thirty-three hundred microscopic examinations of feces

made during the past year at the Veterinary College, Ohio State University, showed about thirty-five per cent to contain parasitic ova, belonging to the four following classes: Belascaris (roundworm), forty-four per cent; Taenia (tapeworm), twenty-four per cent; Trichuris (whipworm), eighteen per cent; Ankylostoma (hookworm), fourteen per cent. It is of the utmost importance to determine the species of parasites present in order to apply treatment successfully. This is easily accomplished by a microscopic examination of the feces.

The treatment applied will depend upon the species of parasite present. For the elimination of the Ankylostoma, the most common drug used is carbon tetrachlorid. This is given in doses of 0.4 cc per kilo of weight and is usually followed with castor oil. In the treatment for Belascaris, a number of preparations are used, such as areca nut, kousso, santonin, oil of chenopodium and carbon tetrachlorid. Probably the best is oil of chenopodium, two drops in a teaspoonful of castor oil. Arecolin hydrobromid, one-tenth to one-fourth grain, depending on the size of the patient, is one of the best teniafuges in use today. It is best given after fasting for about twelve hours. The medicinal treatment of Trichuris is not very satisfactory. Carbon tetrachlorid will eliminate all worms that are in the small or large intestine, but the difficulty lies in getting the drug into the cecum, which is the natural habitat of this parasite. Operation and removal of the cecum has given very good results in the elimination of this parasite.

The above discussion deals with only the more important conditions of the dog. There are many other conditions which are very troublesome and which are of frequent occurrence, but it is not practical to discuss them at this time.

Diseases of Poultry

The diseases of poultry have not received the attention given to the disorders of some of the other domesticated animals. Many practitioners consider their time too valuable to treat poultry. It is true that the care of individual birds can not be considered unless they are of exceptional value, as the cost of treatment will be more than the worth of the bird.

However, the economic importance of poultry diseases is increasing with the growth of the industry. The greatest hindrance to successful poultry husbandry is disease. Most of these mala-

dies can be prevented or controlled. Veterinarians are in a measure responsible for this economic loss.

The modern methods of poultry husbandry have no doubt reduced the ravages from disease, especially those of a non-infectious character. However the flocks have greatly increased in size and often the fowls are crowded. Under such conditions, there is more danger of contagion.

There are many diseases which affect fowls. Some spread rapidly through a flock and occasion high mortality, while others are more insidious in nature, cause emaciation and induce diminished egg production. The greatest losses are caused by infectious diseases. The primary object should be to prevent the introduction of their causative agents into the flock. After a disease has gained entrance it must be controlled or eradicated.

Progress has been made during the past few years in developing specific methods of controlling the infectious diseases. The value of many immunizing agents prepared to combat these maladies is still in dispute and more experimental work is necessary to establish their merit.

It is the purpose of this paper briefly to discuss the control and treatment of those diseases which are most destructive to poultry and to consider the measures essential for their prevention.

Bacillary White Diarrhea

This disease is causing great losses among little chicks, especially during the first two weeks after hatching. It occurs most frequently within two or three to seven days after the chicks are hatched. The symptoms are not at all characteristic of this disease. The little chicks stand around with their feathers ruffled, wings drooping, chirping in a shrill manner and eating very little food. The fecal material is whitish to yellowish in color and soils the down with which it comes in contact. The losses vary greatly, in some instances amounting to eighty or ninety per cent. The chicks which do not die of the disease may live, but are not thrifty, while others may show no external appearances of being infected.

The postmortem examination of little chicks usually shows some enteritis and the presence of an unabsorbed yolk which is hard and dry in consistency. Adult birds, which are carriers of this disease, usually exhibit no external indications of the disease, but on autopsy show the result of the infection localized in the ovaries. The normal ova are changed into irregular masses of

various sizes, and are of a dark brownish color. *Salmonella pullorum*, the cause of the infection, can be isolated from such ova. Eggs from infected hens usually carry the organism in the yolk; consequently, the chick, if hatched, has this organism within the yolk sac where it multiplies and produces the disease. This may terminate in the death of the chick. At times the hatches are exceedingly poor from such hens, probably due to the development of the organism within the chick.

As this disease is very acute and usually occurs before the chick is capable of taking much food, treatment seems to be of little value. Prevention and eradication are the methods to be used to eliminate this disease.

The application of the agglutination test to flocks of chickens is the best known means of eradication. By the use of this test, it is possible to reduce greatly the occurrence of this disease, because it eliminates the infected hens. Experience has shown it to be possible to have practically no losses from white diarrhea in flocks from which reacting hens have been removed. This test should be conducted by trained laboratory workers, as it is just as important to observe care in the technic of this as in any of the other biological tests. One application of this test does not select all of the infected birds. To obtain best results the test should be repeated a number of times over a period of years.

This test eliminates the spread of infection only from the adult hen to the chick. Several methods may be employed to prevent the spread of the infection from one chick to the others. One method of control is to have the incubator trays partitioned into compartments holding four to six eggs. The disease is contracted principally during the first two or three days, so that after this time all chicks that remain healthy can be placed together and all chicks in the compartments in which the disease develops should be isolated or destroyed. Another effective measure of control is to keep the chicks in the dark for the first three or four days after hatching. It is known that baby chicks will not peck at objects when in the dark, therefore, if we are able to prevent them from pecking at the droppings during the infective period, we can prevent the spread of infection. Experimental work in regard to this method is being conducted and good results are reported.

Coccidiosis

This is an infectious disease of fowls, pigeons, pheasants, turkeys, ducks and other birds. It is caused by a protozoan

organism, the *Eimeria avium*. The disease is generally acute and accompanied by symptoms of diarrhea, and emaciation.

Fowls from one week to a couple of months old are subject to it. The young birds are more susceptible than the adult fowls which can carry and continually secrete the infectious matter without injury to their own health. It is obvious that these infected birds are a great factor in the propagation of the disease.

There are no specific symptoms. Diarrhea and emaciation are the most prominent, and the droppings are quite often blood-stained. The birds stand with wings drooping and feathers ruffled. They have no desire to move or eat. In acute cases death occurs in two to three days, while subacute cases may last from two to four weeks. The older the birds, the more chance there is for a complete or partial cure.

The anatomical changes are usually confined to the intestinal canal, more especially to the ceca. The inflammatory changes may consist of a catarrh or croupous-diphtheroid membrane, with thickening of the wall and hemorrhages. The liver sometimes shows secondary lesions such as small white areas uniformly scattered throughout the organ. Microscopic examination of the scrapings made from the wall of the intestines at the point of inflammation will reveal the presence of the causative organism.

The control of this disease, like the control of all infectious diseases, rests upon the elimination of the infectious agent. Adult chickens which may appear normal may be the carriers of the coccidia. Young birds become infected by eating on infected ground. It has been found possible to prevent the young birds from becoming infected by confining them in wire-netting cages.[1] The bottoms of these cages were made of one-inch wire netting. This allows the droppings to fall from the cage and none of the birds has access to them. It also prevents reinfection of the affected birds. The birds should be kept in these cages until about six weeks of age.

Parasitic Infestations

A large variety of parasites infest poultry. Internal and external parasites, when present in large numbers, cause considerable damage. Young birds are more often severely affected than adults. Of the intestinal parasites, roundworms and tapeworms are of special importance. As a rule, chickens which are heavily infested with parasites eat very greedily, but become

[1]Edgington, B. H.: Paper to be published.

lighter in weight and finally die in an emaciated condition. Autopsy will reveal the presence of parasites in the intestinal tract. Tape- and roundworms are usually found in the small intestine, while a small worm, measuring about one-fourth to one-half inch in length, inhabits the ceca.

A large variety of drugs have been used in the treatment of the roundworm of the small intestine, such as santonin, thymol, turpentine, etc., but it is now generally agreed that tobacco is the most practical remedy that has yet been found for removing these worms. It is generally administered in the form of ground tobacco dust, mixed with the mash in the proportion of one pound of dust to fifty pounds of dry mash, feeding this daily for three to four weeks. Growing birds kept in infested yards may require a repetition of the treatment at intervals of about six weeks. There is a great variation in the different tobacco dusts on the market, both in strength and origin, therefore care should be taken in the selection. The nicotin content should not exceed 1.5 per cent, or, if it is exceeded, the amount mixed with each fifty pounds of mash should be reduced accordingly, if laying hens are being treated. An excess of tobacco will cause a reduction in egg-production.

Tapeworms are difficult to treat. Their attachment to the intestinal walls makes them very resistant to the action of agents given to expel them. Male fern, areca nut, lye, turpentine, tobacco and other agents are used as teniafuges. Turpentine is considered by many as the best teniafuge for fowls and, in addition, it is very effective for roundworms. The only disadvantage is that birds must be treated individually. The birds should be fasted for twelve hours and then given one-half teaspoonful of turpentine mixed with one-half teaspoonful of olive oil. This can be easily administered by passing a rubber tube down the esophagus, attaching a funnel and pouring the liquid in the funnel. The following day a hot mash which contains one teaspoonful of magnesium sulphate to each bird should be given. Tobacco, used the same as for roundworms, has been recommended as being effective against the tenia and is much easier to administer. Concentrated lye, one tablespoonful to a gallon of mash, for each unit of fifteen birds, has given good results in some instances.

Tuberculosis

This disease is very frequently encountered throughout the United States. Symptoms of this disease are characterized and

are apparent only in advanced cases, when marked emaciation, paleness of comb, diarrhea and lameness may be noticed.

The lesions consist of round, yellow areas, varying in size from a pin-head to a pea in the liver and spleen, and nodules varying in size from a pea to a small walnut on the intestines or on the mesentery. Lesions may also occur in the kidneys, lungs, skin and bones.

In considering means for the prevention and eradication of avian tuberculosis, the intertransmissibility between fowls and mammals is of special interest. Young cattle have been infected by the injection of avian tuberculosis organisms and fowls have been artificially infected with the bacterium of mammalian origin. In only a few cases has the avian organism been found naturally in cattle. However, pigs fed with avian tuberculous material have been infected with some regularity. Fowls are not generally susceptible to the human and bovine strains.

The tuberculin test, together with sanitation and careful culling, will result in the elimination of the greater portion of the diseased birds. Birds in the advanced stages of tuberculosis very frequently fail to react to the test. In the application of the test, it is advisable to use avian tuberculin. This is injected into the skin of the wattles, at which place a swelling will occur if the bird be infected. The amount injected is about one-tenth cubic centimeter, a small syringe with a 27-gauge needle being used. It is necessary to make repeated tests at intervals of about six months to free a flock from tuberculosis. Following each test, all reacting birds must be removed from the flock and the houses given a thorough cleaning and disinfection. All new birds added to the flock should be tested.

Roup

Difference of opinion exists among investigators in regard to the relationship of the various pathological conditions that affect the heads of fowls. Chicken pox, avian diphtheria and roup are considered by some as separate diseases. Our experience leads us to believe that they are different manifestations of the same infection.

The symptoms and lesions of roup are so characteristic that it is relatively easy to make a diagnosis. Owners of birds frequently complain that the birds make peculiar noises, shake their heads, and show a discharge from the nostrils. This may be followed by bulging of the sinuses or discharge from the eyes, swelling of

the eyelids, and diphtheroid lesions in the oral cavity and larynx. At times, the eyes are greatly swollen and the conjunctival sac is filled with a cheese-like material. In nearly every flock affected there are lesions upon the comb and wattles, this being characteristic of the so-called chicken pox.

Outbreaks vary greatly in severity, in some flocks only a few birds being affected, with practically no loss, while in others the entire flock may show lesions with a high mortality. Economic loss results from decreased egg-production and from the death of the infected fowls.

In the prevention and treatment of roup, one of the first essentials is the proper housing and feeding of the birds. Common faults in housing conditions are: presence of cracks in the wall back of the roosts, poor ventilation, overcrowding, dampness and lack of sanitation. A proper feeding ration is very essential, as recent investigation has shown that the absence of greens is conducive to the development of lesions such as are encountered in roup. Vaccination has been used very extensively. Some investigators have reported good results following the use of vaccines. Their experiments, however, indicate that the proper controls were not used to determine the benefit derived from the use of this product. Dr. L. W. Goss,[1] using a large number of birds, in which one-half the birds were vaccinated and the other one-half left untreated, found that the vaccinated birds did not show any improvement over those not vaccinated. At the present time, our efforts should be directed toward providing the proper housing conditions, proper feeding rations and sanitary conditions.

Fowl Cholera

Cholera in birds is at times responsible for great losses. It is a very acute condition and is characterized by the sudden death of the birds. The disease usually occurs among flocks of pullets during the period of heavy egg-production.

The symptoms are droopiness, diarrhea, discoloration of the comb, usually followed by death within twenty-four hours. Birds may be found dead in the nests or on the dropping boards. The postmortem examination usually shows an enlarged, soft liver, which may have minute yellowish-white areas; petechial hemorrhages on the surface of the heart and on the thoracic wall dorsal to the lungs are very common. Enteritis may or may not be

[1]Paper to be published.

present. It is not unusual to find a broken egg yolk in the abdominal cavity, which may appear as freshly broken or may be in the form of a cheesy mass.

The losses may cease as suddenly as they started. At other times the deaths continue over a long, drawn-out period and may take the greater portion of the flock. The use of bacterins in controlling fowl cholera has not been generally satisfactory. In some cases, where bacterins have been used, deaths were more numerous in the ones treated than in those not treated. The means of combating this disease are sanitation and proper feeding. Excellent results have been obtained from a change of diet, eliminating the highly concentrated foods and allowing more green feed and less nitrogenous material.

Infectious Entero-Hepatitis or Blackhead

This disease is mainly a disease of turkeys. Young turkeys are very susceptible and the greatest losses occur during the first two or three months of life.

The principal lesions of the disease are confined to the ceca and liver. The ceca, apparently the primary seat of the infection, show marked inflammation with extensive adhesions and perforations. The liver contains yellow circular spots of various sizes up to that of a hazel nut. Birds which do not die of the disease are apt to be carriers of the parasite as long as they live and this may be the means by which the disease is usually transmitted to young turkeys.

The treatment of this disease has not met with much success. Ipecac is recommended by some as a prophylactic, administered as follows: To each unit of twenty turkeys give two teaspoonfuls of powdered ipecac in the mash, twice a week from the time the birds are two weeks old until three months of age. After that time the dosage may be reduced to one teaspoonful every ten days for the same number of turkeys. The use of powdered tobacco (2%) in a dry mash has recently been used and, according to the results reported, considerable benefit has been derived.

Leg-Weakness

During the past few years, considerable trouble has occurred in young growing birds due to a condition known as leg-weakness Heavy losses have occurred especially in chicks which were confined in houses during the first two months of life. This condition is brought about by improper feeding, lack of sunlight and exercise, and overcrowding. It is not likely to occur if flocks are fed

a properly compounded ration, are not crowded in the brooder-house, and are allowed to run out of doors early.

When the disease does occur, it can be controlled by making changes in the diet and in the method of housing. This disease can be prevented by the use of cod-liver oil in the feed during the first six weeks of life. It is given by mixing one quart of the oil with one hundred pounds of mash and fed daily.

The diseases that have been mentioned are probably those most worthy of consideration, but losses are sustained from other diseases, such as typhoid, botulism, lousiness, enteritis, etc. Some diseases can be prevented by proper feeding and housing. Poultry should be supplied with a balanced ration and clean water. The houses must be well lighted and ventilated, in order that they may be kept dry.

The soil on which fowls are kept year after year becomes badly infested with the ova of parasites and also harbors disease-producing organisms. Young birds should be raised on clean ground, in small flocks, and apart from the old fowls.

A correct diagnosis is necessary in order to prescribe rational treatment and control measures. Practitioners in most cases must depend on the history, symptoms and postmortem findings to determine the cause of the disease. Where results are to be obtained from the use of biological products, it is of the utmost importance to establish a correct diagnosis.

COLLEGE NOTES

Dr. Robert Graham (Iowa '10) has returned to his post at the University of Illinois, after a year spent in Haiti.

Dr. Alexander Kotlan, assistant professor and lecturer on zoology and parasitology at the Royal Hungarian Veterinary College, Budapest, in this country during the past year as exchange professor, at the Michigan Agricultural College, under the auspices of the American-Hungarian Foundation, lectured at the University of Illinois, in April. He delivered two lectures in the Department of Zoology, "A survey of our knowledge on the development of parasitic nematodes with particular reference to the migratory phenomenon," and "The pathologic significance of recent discoveries in the field of the development of parasitic roundworms."

THE FEEDING OF SWINE BEFORE AND AFTER VACCINATION*

By Roy E. Kluck, *Forreston, Ill.*

The title of this paper looked very big to me when I looked at it and gave it a little thought and, as a matter of fact, one cannot take up all phases of it and I suppose some of you are wondering which one I will take up.

In preparing swine for vaccination I would advise against any radical change in the kind of feeds being given, unless they were causing intestinal disturbances, in which case I would advise that the feeding be changed to correct the disturbances *before* vaccination, if possible.

You all know that it is often impossible and impractical to waste time trying to correct methods of feeding when you have cholera infection present, and must resort to vaccination as soon as possible, and that is not always soon enough. I would, if it were possible, reduce the amount of the ration, especially in those animals which are being heavily fed for growth or market.

I once made the mistake of advising a cut of 50 per cent in the ration following vaccination, and got into some trouble, but I now advise feeding only a maintenance ration for the first two weeks following vaccination, with a raise to full feed during the third week if no trouble has appeared. Where this has been followed out I have had no trouble, but there have been times when clients did not see fit to do so and caused much trouble, and eventually some of them would try to saddle the blame onto poor serum, or anything else but where it belonged, that is, themselves.

Your clients do not like this idea of seeing their hogs at a standstill for a couple of weeks, but it seems to me that I am rendering them better service by so advising them, and preventing troubles due to that cause. I find it necessary to feed a smaller ration in warm weather than when it is cold. It seems to me that by faulty or heavy feeding one will get breaks which do not occur otherwise.

Case Report

A herd, consisting of over 200 head, was vaccinated, about twenty-five of them being in one pen. Being pure-bred and the

*Read before the forty-second annual meeting of the Illinois State Veterinary Medical Association, Chicago, Ill., Dec. 2-3, 1924.

pick of the herd, they were being forced for show purposes and in another pen were about fifty, which one could say were doing fine, while in another pen were the poorer ones, which were being fed as common stock. Vaccinating was done at the same time and the usual precautions about feeding were given. In about ten days cholera developed, with a loss of six and two recoveries in the good bunch, and a loss of two out of the second or medium bunch, and a loss of one out of the larger, more poorly fed bunch, which was due to worms. It took two years of similar experiences to convince this client that there was something to feeding, as well as using good serum and virus, and doing the work well.

In another case, where a herd of about eighty head of all sizes was vaccinated, they were allowed to run at large, with free access to a field of good corn and, as a stimulant, several carcasses of horse meat were fed; there was a loss of ten or twelve head, about thirty days later, with the spread of the disease to another herd.

In regard to the amount of roughage fed to hogs, I believe that feeding too much indigestible matter will often cause much trouble to hogs before and after vaccination. One must not depend entirely on what an animal can get in a pasture, in all cases, as often the animals will have indigestion from too much roughage.

You should all know that oats, as a feed for swine, contains much more indigestible material than does corn, and where oats is being fed in large amounts, as the main feed, there may be too much indigestible material. This may be lessened by grinding and bolting the oats or, where it is fed wet, a large part of the hulls may be floated off in a barrel and disposed of otherwise.

To illustrate, I will mention a case of a herd of about thirty sows which were running after cattle fed on corn fodder, that is, corn just as it comes from the shock with all the corn in it. When called, one sow had aborted and was past treatment, and another was then aborting and two more were showing all symptoms of starting to abort.

Those showing trouble were separated and given about one-half pint of mineral oil each, and the whole herd penned away from the cattle and given no feed for twenty-four hours. Then a light feed of corn was given for a few days, after which they were fed corn in place of oats and returned to the lot to feed after the cattle and no further trouble resulted.

The point I wish to bring out is this: that these animals, in following the cattle, ate nearly all that passed through the cattle

and this contained a lot of indigestible material and, with a ration of oats, they were getting too much indigestible material in their ration.

It is advisable, in most cases, to feed the available feeds and avoid the high prices which must be paid for feeds shipped in.

STATE BOARD EXAMINATION

Iowa State Board of Veterinary Examiners. State House, Des Moines, Iowa. July 7-8, 1925. Dr. P. Malcolm, Secretary, State House, Des Moines, Iowa.

ANDY GUMP ON PORTLAND

Quoting from one of the campaign speeches of Hon. Andrew Gump, made just before the elections of last fall:

"My grandfather always said when the angels saw a guy in Heaven with a homesick look on his face they knew he was from Portland. When I hear people talking about the best city in the world, I know they mean Portland. Where can you find better living conditions, better climate, better people, better anything? The answer is, 'No where.' My father always said he'd rather be in jail in Portland than be mayor of Seattle, and father was noted for his good judgment."

With Dr. Simms and Andy Gump pulling for Portland, other cities simply have no chance.

The Oriental Limited crossing the Mississippi River below St. Anthony Falls, Minneapolis.

THE RESULTS OF TREATMENTS OF 766 CASES OF AZOTURIA*

By V. G. KIMBALL,

School of Veterinary Medicine, University of Pennsylvania

Before going into the details of this report, I wish to make it clear that it is made up entirely from "city" azoturia patients. It is well known that there is a great difference in mortality between city and country cases of this disease. Many of those occurring in rural districts are apparently equally as severe as the worst ones handled in the city, yet the former frequently recover while the latter almost invariably terminate fatally. It may be that in the country districts the driver, who is often the owner and therefore greatly interested, is not far from his own or a neighbor's stable when the first symptoms are noticed. The patient can be stabled before the disease has progressed far.

In the city, however, there are few convenient places to drive in with a sick horse. The driver tries to get back to his own stable. Frequently the horse goes down two or three times before becoming completely exhausted. Then follows a long wait on an icy pavement until an ambulance arrives. The patient is hobbled and hauled some distance to a hospital. Most horses resent being hobbled and, if in a state of excitement, struggle violently the entire distance. This great muscular activity seriously aggravates the condition so that by the time the hospital is reached there is little if any hope. Again it may be that country horses are not fed as highly a nitrogenous diet as horses kept in the city. Perhaps a difference in weight may have some bearing upon the explanation. City draft horses are probably much heavier than those used on farms. The lighter the patient, other things being equal, the better the chances of recovery. It is seldom that a horse weighing 1500 pounds or more, affected in both hind legs, recovers.

Prof. Cadiot, of Alfort, in speaking of tetanus, once said in effect: "There are two kinds, mild and severe; the mild cases will recover whether treated or not and the severe ones will die in spite of all that may be done." The same thing holds true in a very large degree with azoturia. There are mild and severe cases. Some are mild, with one leg affected; others are severe, with one

*Presented at the Conference of Veterinarians, University of Pennsylvania, School of Veterinary Medicine, January 6, 1925.

leg involved. Some are mild, with both hind legs affected, and others are severe when similarly attacked. Frequently a case appears mild at the start only to become rapidly worse in one or two hours. It is often very difficult to make an accurate prognosis at any stage of the disease. Mild cases either stand or lie quietly, turn themselves, etc. Severe cases show great mental excitement, sweat profusely, are very restless, even violent, and unable to turn themselves.

Many of the cases that recover do so with little or no therapeutic attention. Therefore it is only fair to claim any virtue for a certain line of treatment when it has been successfully used on a large number of severe cases. In summarizing (table I) the treatments we have used, all cases have been divided into two classes, mild and severe. This classification was made when the case entered the hospital. Of course our judgment was not

TABLE I—*Summary of treatments*

	Method	Cases		Died	Recovered
		Kind*	Number		
1	Phlebotomy (2 to 8 quarts)	S	27	26	1
		M	6	0	6
2	Ditto and normal salt solution intravenously	S	22	20	2
		M	8	1	7
3	Ditto and alkaline solution intravenously	S	9	9	0
		M	3	2	1
4	Physics (aloes, arecolin, barium chlorid, etc.)	S	29	29	0
		M	27	5	22
5	Sodium bicarbonate (6 to 8 ounces)	S	13	12	1
		M	8	0	8
6	Calcium chloride (5 gm. in 20 cc water intrav.)	S	4	4	0
		M	3	0	3
7	Azolysin	S	7	7	0
8	No medicinal treatment (nursing)	S	28	21	7
		M	171	18	153
9	Chloral hydrate (2 to 4 ounces)	S	19	15	4
		M	8	0	8
10	Miscellaneous (various drugs and measures)	S	291	273	18
		M	83	76	7
	Totals	S	449	416	33
		M	317	102	215

*S—Severe. M—Mild.

always accurate for what looked like a mild case some times proved fatal and vice versa. But on the whole these prognoses coincided with the outcome to a remarkable degree.

Perhaps it would be of interest to record the occurrence of the disease by years and months. Tables II and III give this information.

TABLE II—*Occurrence of azoturia by years.*

YEAR	RECOVERED	DIED	TOTAL CASES	RECOVERIES %
1910	9	26	35	25.7
1911	17	40	57	29.8
1912	12	20	32	37.5
1913	17	44	61	27.9
1914	21	56	77	27.3
1915	7	35	42	16.6
1916	18	41	59	30.5
1917	15	41	56	26.8
1918	9	32	41	22.0
1919	12	24	36	33.3
1920	17	35	52	32.7
1921	18	19	37	48.7
1922	23	27	50	46.0
1923	30	46	76	39.5
1924	23	32	55	41.8
Totals	248	518	766	32.4

TABLE III—*Occurrence of azoturia in different months of the year*

MONTH	CASES	MONTH	CASES
January	118	July	6
February	114	August	3
March	87	September	39
April	74	October	47
May	55	November	56
June	15	December	152
		Total	766

It is interesting to note that the total for December, January and February (384 cases) is just one more than fifty per cent of the total number of cases. This is not surprising, because cold is an important etiological factor in azoturia. But it is not an essential one, as is shown by the occurrence of the disease in every month of the year. It might be added that the summer months in this city are far from cold.

In regard to treatment, a comparatively few animals received one method only. Such as did are recorded in the chart under "method." A far greater number received many drugs and com-

binations of drugs and these are listed under miscellaneous. The chart is fairly self-explanatory, so only a brief discussion of the methods need be given. All cases were given the usual nursing, care and attention, such as frequent emptying of the bladder, rolling over, etc.

The following discussion refers to table I.

1. Phlebotomy. From two to eight quarts of blood was drawn from the jugular vein.

2. The blood drawn was replaced with an equal amount of normal salt solution at body temperature.

3. The blood drawn was replaced with 3 to 5 liters of an alkaline solution made up as follows:

Calcium chlorate	0.02%
Sodium chlorate	0.8 %
Potassium chlorate	0.02%
Sodium bicarbonate	0.1 %

This treatment has received considerable attention of late. Its supporters claim it will help overcome the lessened alkalinity of the blood, claimed by Dieckerhoff to be present in azoturia. It seemed to prove harmful in two mild cases.

4. If there is any one agent which the veterinary profession is quite generally agreed should be given to azoturia cases it is an aloes ball. The writer, however, shares the view held by many others that aloes is too slow in action to be of any benefit. If it operates it does so at a time too late to do any good, in fact it seems to weaken a patient at a time when all the powers of resistance are most needed. An aloes ball frequently sickens a healthy horse. A milder and quicker acting laxative, such as linseed oil, is preferable.

5. Sodium bicarbonate was given by the mouth in six- to eight-ounce doses at six-hour intervals. Two or three doses were given. This was administered with the same object in view as stated under 3.

6. Calcium chlorid, in five-gram doses, dissolved in 20 cc of sterile water, was given intravenously at 30-minute intervals until three or four doses had been administered.

7. Azolysin, a proprietary remedy, received considerable attention a few years ago. When its formula (oxalic acid, citric acid and coniine hydrochlorid) was disclosed, the writer tried it on seven severe cases without avail. Like many other such remedies it seems to have had its rise and fall. As long as its

nature remained somewhat mysterious it gained in fame, but once it was disclosed, doubts arose.

8. Under the heading, "no medicinal treatment," have been included those cases which were very mild, that is, slightly affected, quiet, in many instances standing on three legs, and also a few severe cases in which there was apparently no hope and the owner ordered the destruction of the patient. (Of course, nursing, care and attention was not neglected.) It will be noted however that 25 per cent of these severe cases did recover, a percentage not equalled in any other method. One of these severe cases was affected in all four legs and the owner, an experienced horseman, gave him up. To our surprise the case recovered.

9. In those cases where great restlessness exists, no surer acting narcotic can be found than chloral hydrate. If given in a four-ounce dose, dissolved in linseed oil, the narcosis is obtained in from ten to fifteen minutes. Our patients generally arrive in an ambulance, fully hobbled. We administer the medicine immediately and wait fifteen minutes before releasing the hobbles. By this time the patient is generally quiet and does not attempt to arise. It is seldom necessary to repeat the dose, since the delirium usually passes away in the hour or two that the patient is narcotized. If desirable it may be repeated. In the writer's hands this is the one best drug found expecially valuable. Cannabis indica intravenously will work nearly as well, but this drug is hard to obtain. The American cannabis is not as reliable for this purpose. In fact it frequently adds to the excitability of the patient.

10. Under "miscellaneous" is included a great variety of treatments, some of which were given by the owner or a veterinarian before the patient reached the hospital. In many cases complications (colic, pneumonia, broken ribs, etc.) arose, calling for additional remedies. A number received two or more of these treatments already mentioned. Among the many therapeutic measures employed by ourselves or others were: liniments, Haarlem oil, colic mixtures, lobelin sulphate, digitalis, digitalin, digalen, methylene blue, turpentine, fifty grains of magnesium sulphate in one liter of water intravenously, cannabis indica, adrenalin chlorid, sugar, potassium iodid, subcutaneous injections of sterile air (recommended by Brunschwik), hot blankets, cold blankets, slings, etc. These various measures were usually in combinations, so that it is difficult to draw conclusions except to

say that the mortality in the severe cases thus treated agrees closely with the mortality in general in such kinds. Some of the mild cases were either misjudged or the treatments had a deleterious effect, for we find 76 deaths in the 83 so classified.

The use of slings is very limited. If the patient cannot stand without them they should not be used. If it can stand they are seldom needed. On numerous occasions, autopsy has revealed intramuscular hemorrhage caused by forcing an animal to stand in slings. They may be useful in preventing the aggravation of decubital sores when the patient is convalescing and can stand comfortably.

In a final summary it would appear that there is no specific treatment for azoturia. Good nursing, which includes deep bedding, frequent rolling over, emptying bladder and rectum, and plenty of drinking water, stands paramount. Rest is essential. If necessary, enforce it with narcotics and the most reliable agent in this connection is chloral hydrate in large doses. It may be safely given in three- to four-ounce doses, dissolved in one or two pints of linseed oil. It sometimes happens that the pharyngeal muscles are involved in severe cases, thus making drenching a dangerous procedure. Such cases would hardly be expected to recover under any treatment.

A careful postmortem examination of the severe cases reveals lesions of such a nature that one might well despair of effecting a cure. Our efforts will be more satisfying if we direct them toward prevention of the disease. Even when recovery follows, let us not be too credulous. In this connection the following quotation, from Frohner's Text-Book of General Therapeutics (translated by Klein), seems appropriate: "If, after the use of this or that therapeutic measure, the disease is cured, this is not in itself proof that the treatment applied was the cause of the cure. *Post hoc* is not *propter hoc*. On the contrary, every recovery should be considered candidly and objectively to determine what share in the cure is to be credited to the healing powers of nature and what part was played by the therapeutic measures employed. The observance of this rule is very necessary, especially in veterinary therapeutics. Fallacious, speculative conclusions from meagre casuistic material, and unjustifiable commendation and overrating of new remedies are in veterinary medicine almost more common than in human medicine."

See America First via Great Northern

THE EFFECT OF CARBON TETRACHLORID ON PUPPIES*

By A. S. SCHLINGMAN, *Detroit, Mich.*

Medical Research Laboratories, Parke, Davis and Co.

The first use of carbon tetrachlorid for the expulsion of hookworms was by Hall,[1,2] who found that 0.3 cc per kilogram of body weight was safe and very effective in dogs, although in most instances much larger doses were tolerated without any bad effects being noted.

In a recent letter from Dr. Hall he states that in view of the large margin of safety present with carbon tetrachlorid this dose of 0.3 cc per kilogram of body weight is approximately correct and should be safe except for puppies which appear to be more susceptible to the bad effects of the drug. In these young animals he advises reducing the dose somewhat and insuring prompt purgation, so that no absorption of the drug might occur.

These recommendations, together with the reports of several fatalities occuring in puppies following the administration of relatively large doses of carbon tetrachlorid, led to experiments to determine, if possible, the effect on these young animals, as well as a more accurate dosage.

In carrying out this work six groups of puppies, varying considerably in age and weight, were used. No effort was made to determine the efficacy of the anthelmintic by means of preliminary fecal examinations or by examination of the feces for parasites after the drug had been given. The carbon tetrachlorid was administered, in the regular soft elastic globules, to the puppies of all groups, except the last four, to which it was given in hard gelatin capsules.

It has been thought, by some, that since carbon tetrachlorid, enclosed in these globules, rendered the gelatin insoluble in hot water they would be insoluble in the animal's stomach, although Hansen and Van Volkenberg[3] found that it required only 1 to 1½ hours for them to be dissolved in the stomach of the fox.

To determine their solubility in the stomach of the dog, four animals which had been fasted about six hours were given one globule each, two receiving globules from a lot over one year old and two from a lot about nine months old. At the end of an

*Read before the forty-second annual meeting of the Ohio State Veterinary Medical Association, Columbus, Ohio, Jan. 7, 1925.

hour one dog of each group was destroyed and the stomachs examined for the presence of the globules. In both cases, although the stomachs were partly filled with food, the capsules were entirely dissolved, the carbon tetrachlorid being mixed with the food. The other two dogs were destroyed at the end of one and one-quarter and one and one-half hours, with the same results as before.

Thinking that the fullness of the stomach might have some effect on the solubility of these globules, two dogs, which had been fasted 32 hours, were given each two globules from the lots used before. Both animals were destroyed approximately one hour later, when it was found that although the stomachs and bowels of both were entirely empty, no trace of the globules could be found. The carbon tetrachlorid had at that time passed into the duodenum.

Apparently the solubility of these globules is not affected either by their age or by the fullness of the stomachs, the drug being set free and available for its anthelmintic action within an hour after the administration of the globules.

Of the first group of puppies (table I), which were treated

TABLE I—*Results of treatment of puppies three months of age. No purgative given*

PUP	WEIGHT (LBS.)	CARBON TETRACHLORID (CC)	TREATED	RESULTS
1	10	1.0		
2	10	1.5	11-5	O. K.-10
3	8	2.0		

with the carbon tetrachlorid and which were about 3 months of age, two weighed 10 pounds each and one 8 pounds. The first two were given 1 cc and 1½ cc respectively, while the smallest received 2 cc of carbon tetrachlorid. After five days' observation no ill effects were noted, even though none of the puppies received a purgative following the administration of the anthelmintic. These animals were later used in another experiment and on autopsy, practically 30 days after giving the carbon tetrachlorid, no worms of any sort were found.

In the next group (table II) 6 puppies under 6 weeks of age, and weighing from ¾ to 1¾ pounds were given ½ cc each

TABLE II—*Results of treatment of puppies four to five weeks of age. Dose of carbon tetachlorid, 0.5 cc. Epsom salts as purgative*

PUP	WEIGHT (LBS.)	EPSOM SALTS (GR.)	TREATED	RESULTS
1	1½	36	11-5	Dead 36 hrs.
2	1½	36		Dead 24 hrs.
3	1¾	36		Dead 22 hrs.
4	1½	0		Dead 23 hrs.
5	1¼	0		Dead 36 hrs.
6	¾	0		Dead 16 hrs.

of the carbon tetrachlorid, 3 receiving Epsom salts at the same time, the other three receiving none. Within 36 hours all these puppies had died, autopsy showing lesions of toxemia due to the drug. Dead roundworms were found in the lower portions of the intestines of all. No hookworms were noted.

TABLE III—*Results of treatment of puppies three months of age. No purgative given*

PUP	WEIGHT (LBS.)	CARBON TETRACHLORID (CC)	TREATED	RESULTS
1	9	2.0	11-8	O. K. 11-21
2	12	2.0		
3	14	3.0		
4	11	3.0		

In another group (table III) 4 puppies about 3 months of age and weighing from 9 to 14 pounds were given the carbon tetrachlorid in doses of 2 and 3 cc. After several weeks' observation no detrimental effects were noted.

In another group (table IV) 6 puppies, just weaned (about 6 weeks of age), were used. They varied from 2 to 4 pounds in weight. Each animal was given 0.35 cc of carbon tetrachlorid, in hard gelatin capsules, which dosage was in most cases slightly under the recommended 0.3 cc per kilogram (0.137 cc per pound). Three of the animals received practically one dram of Epsom salts each, while the other three received none.

TABLE IV—*Results of treatment of puppies six weeks of age. Dose of carbon tetrachlorid, 0.35 cc. Epsom salts as purgative*

PUP	WEIGHT (LBS.)	EPSOM SALTS (GR.)	TREATED	RESULTS
1	3	36	11-19	O. K. 12-4
2	3½	0		O. K. 12-4
3	3	54		Dead 11-20
4	2	0		Dead 12-3
5	3½	54		O. K. 12-4
6	4	0		O. K. 12-4

When the drug was being given to pup 3, the capsule became lodged in the pharynx, where it was dissolved sufficiently to allow the contents to escape. After the animal was held head down for a time, to avoid inhalation of the drug, it was thought that a part or all of the drug was lost. Consequently, another dose of 0.35 cc was immediately given. Apparently none of the first dose was lost for although it received approximately one dram of Epsom salts at the time, the puppy died within 24 hours, autopsy showing lesions of toxemia due to the drug. A few dead roundworms were found in the stomach.

Although, as in the other groups, no effort was made to check the anthelmintic, it was noted that all these puppies passed large numbers of roundworms. No hookworms were noted.

After five days' observation, no ill effects in the remaining puppies were noted, at which time they were used for another experiment.

Two weeks after receiving the carbon tetrachlorid puppy 4 died, the only postmortem lesions being those of slight pneumonia. No lesions thought to have been due to the drug were found, although death may have possibly been due partly to this cause. No parasites of any sort were found in the intestines.

The remainder of this group were in excellent condition at this time, showing a marked improvement over that shown at the time of treatment.

Disregarding the puppy which died two weeks after receiving the carbon tetrachlorid, and which received an amount slightly in excess of the recommended 0.3 cc per kilogram of body weight, these young animals seem to tolerate approximately 0.12 cc

per pound of body weight. To determine more accurately the safety of this dosage two more groups of puppies were treated.

The first of these two groups (table V) consisted of one litter of six puppies, four weeks of age. Their weights varied from 10½ to 16 ounces. Although these puppies had not learned to eat well at this time, it was necessary to wean them the same day the carbon tetrachlorid was given. No purgative was given with the anthelmintic.

Following this treatment one puppy died in 42 hours, one in 45 hours, one in 4 days, one in 6 days and one in 11 days. The remaining one was in good health two weeks after treatment. Of the five puppies which died, the first two were the only ones which showed evidence of toxemia due to the drug. A few dead roundworms were found in the intestines. Death of the others may have been due partly to chilling and inanition. A few roundworms but no hookworms were found in the intestines of these.

TABLE V—*Results of treatment of puppies four weeks of age*

PUP	WEIGHT (OZS.)	CARBON TETRACHLORID (CC)	TREATED	RESULTS
1	16.0	0.12	12-11	Dead 12-15
2	11.2	0.08		Dead 12-13
3	10.5	0.07		Dead 12-13
4	13.7	0.1		Dead 12-22
5	15.5	0.11		O. K. 12-25
6	11.2	0.08		Dead 12-17

The four puppies in the last group (table VI) were somewhat larger and older than those in the preceding group, varying in weight from 1¾ to 2 pounds and being about 6 weeks of age. These puppies were left with the dam during the ten days' observation following the administration of the carbon tetrachlorid in doses of 0.12 cc per pound of body weight.

As in the previous groups, no effort was made to determine the efficiency of the anthelmintic, but a few roundworms were noted in the feces. No hookworms were noted. After ten days' observation these puppies were all apparently normal, no bad effects whatsoever having been observed.

It would seem, from the results obtained, that puppies over

TABLE VI—*Results of treatment of puppies six weeks of age*

PUP	WEIGHT (LBS.)	CARBON TETRACHLORID (CC)	TREATED	RESULTS
1	2	0.24	12-19	O. K. 12-29
2	1¾	0.21		
3	1¾	0.21		
4	1¾	0.21		

three months of age and weighing above eight pounds, will tolerate relatively large doses of carbon tetrachlorid without any bad effects resulting.

Smaller and much younger animals do not tolerate any great amount of the drug, relatively large doses producing death in 24 to 36 hours, with postmortem lesions of toxemia due to the carbon tetraclorid. Puppies one pound in weight and under four weeks of age apparently do not tolerate even relatively small doses of the anthelmintic and especially so when the animals are weaned just at the time of treatment.

SUMMARY

1. Pups 3 months of age (8 pounds and upwards) tolerate doses of carbon tetrachlorid which are considerably in excess of the recommended 0.3 cc per kilogram of body weight.

2. Puppies 6 weeks and under do not tolerate any great amount of carbon tetrachlorid, ½ cc and a lesser amount in extremely young animals, with or without a purgative, being sufficient to produce death in 16 to 48 hours.

3. To puppies between the ages of 6 weeks and 3 months, 0.12 cc per pound of body weight can be given without any bad effects.

4. Although soft gelatin capsules containing carbon tetrachlorid are insoluble in hot water they readily dissolve in the stomach of the dog within one hour. The solubility of these capsules is apparently not affected by either the fullness of the stomach or by the age of the capsule.

REFERENCES

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[3]Hanson, Karl B. & Von Volkenberg, H. L.: Notes on the treatment of foxes with carbon tetrachloride and the use of soft elastic globules for preventing inhalation-collapse. Jou A. V. M. A., lxiv (1923), n. s. 17 (3), p. 318.

OUR ASSOCIATION—A RETROSPECT AND A PROPHECY*

By GEORGE C. FAVILLE, *Hampton, Va.*

Our Secretary called on me for a paper. I am not in a position to write a technical paper for, being largely out of touch with active practice, I feel rather lost to the feeling that comes from actual contact with everyday clinical work. However, I have not yet lost my love for the profession nor my admiration for the man who does the active drudgery of everyday practice. Our Secretary asked me to review somewhat the active work of our Association. You will, perhaps, pardon the garrulity of old age, for it is a fact that counting by age, I am fast getting into that class.

The development of our profession in Virginia parallels in many respects its development in the country at large. I was greatly struck with the remarks of Dean Moore at the meeting of the Southeastern States Veterinary Medical Association in this city in November when he spoke of those noble pioneers in the profession in America—McEachran, Smith, Law, Liautard, Salmon, and I must add my personal and much loved friend Stalker, who stood for all that is good in our profession and inspired his students to believe that ours is a profession second to none, and who did so much to impress upon the world that the veterinary profession is just as much a profession as its sister profession of medicine, or any other of the so-called "higher branches of learning."

January 1, 1894, I was sent to Virginia by the then chief of the B. A. I., to take charge of the Bureau's work in supervising the export cattle trade from our Virginia ports. There were a few practitioners in the state. I will not try to recall all of them, but permit me to say, in passing, that a man's standing in his locality depended entirely upon his ability to force people to recognize his worth. There were a few graduates in the profession in the state and there were many "horse doctors." Some of the states north had begun to recognize the work of veterinarians and the value to the live stock industry of the veterinary schools and, by passing protective laws, were forcing the charlatans to move south to a more pleasant climate. Virginia was getting her full share of these. Among the outstanding names of the

*Read before the thirty-second annual meeting of the Virginia State Veterinary Medical Association, Richmond, Va., January 8-9, 1925.

profession in this state in the early part of 1894, I can mention only a few for space would not permit naming them all, but I cannot pass without mentioning Harbaugh, of Richmond, than whom I have never met a firmer friend or better practitioner; Niles, of V. P. I.; the Myers brothers, of the Valley; Bushman, of Norfolk; and last but by no means least, our mutual friend Gilchrist, of Norfolk. Harbaugh, Niles, Bushman, Rhodes, Gilchrist, Bannister—these names should be cherished among the members of our Association as the founders of veterinary medicine in this state. There have been many names that have reached a wider publicity, many men who have achieved a greater success financially, many who have become nationally known and whose achievements have placed Virginia well to the front in our profession but, may I suggest that it was the vision and enthusiasm of these few men that made it possible for this Association to wield the influence for good that it has in these later years. The action of these men brought the profession before the public in a way that demanded instant recognition. One of the bright spots in this picture is the ready recognition of our Association by the medical profession. I would fail in a solemn duty did I not recall with feelings of profound gratitude, the friendly sympathy and active help of Dr. Geo. Ben. Johnson, Dr. Garcin, Dr. Hoge, and other medical friends in this city and other parts of the state, who, by council and advice and active participation in the Association's affairs helped to steer our uncertain way among the rocks of opposition, legislative and otherwise.

The little things of life are often of the most importance. "Great oaks from little acorns grow." A match may start a conflagration. Kate O'Grady's cow, by kicking over a lantern, burned up the greater part of Chicago. Six men in a casual conversation in Harbaugh's office, in February, 1894, started this Association. That was a little thing itself. Has it resulted in great good? The answer is self-evident.

Under date of February 6, 1894, our minute book reads as follows:

Richmond, Virginia, Tuesday, February 6, 1894.

We, the undersigned veterinarians, have organized ourselves into a society to be known as the Virginia Veterinary Medical Association.

(Signed) George C. Faville, Norfolk
W. T. Gilchrist, Norfolk
W. H. Harbaugh, Richmond
T. A. Donaldson, Richmond
A. W. Swedburg, Richmond
E. P. Niles, Blacksburg

The Association was organized with all the officers and got down to business at once. The Legislature was in session and as a result of the Association's activities, a law was put on the statute books just as it now stands and the Association secured a charter by an act of the Legislature. By the end of the year 1894 the Association had grown so that we felt able to travel a little and the January meeting was held in Charlottesville. Those were pre-Volstead days and the 18th Amendment was not in force, Charlottesville was not dry then and most of the members were. We had a good meeting and two of us were able to take the early morning train home. There were five names added to the roster at that time. Not one of those names can be found on our list now. Of the original six who organized the Association, Dr. Gilchrist and the writer are the only ones still on the roll. The success of our Association has been the result of thirty years of continued, persistent, hard effort and, more than that, the sincerest loyalty on the part of all the members. In the early days the efforts of the unqualified men, together with the efforts of some of our political friends, made life rather strenuous, but every man had the spirit of the pioneer and opposition simply meant more determined effort to succeed.

Man achieves success because of personal effort well directed and we get out of life just in proportion to what we put into it and success depends upon service, personal service and team work; the support and service of each for the other. "No man liveth unto himself." He may try but he can not succeed. Dependence upon each other is the foundation of all civil society and the basis of all success. No one man has made this Association what it is. "I hold the world but as a stage where every man must play a part." And when a man fails to play his part, the failure is his and no one else can be blamed. The untiring efforts of the founders of this Association have made possible the success of later years. Today we stand successfully conserving the basis of the great industry of agriculture in this great state. Live stock is the basis of successful agriculture and success in the production of healthy live stock is very largely in the hands of the skillful veterinarian. The veterinarian's success beside the personal equation depends upon an appreciative public opinion, not so much in the narrow consideration of the individual as of the profession itself.

I am not a prophet and I realize that a "prophet is not without honor save in his own country." There are some things

that are axiomatic—basic. One of the important words in our language is "if." Now, in forming my prophecy, I shall base it upon the use of this little word. *If* the football team wins, it is because each player has done his best to support every other man on the team. A team in which each man plays for himself without regard for the others, no matter if each man is a star player, is doomed to defeat. *If* the big manufacturing concern succeeds it is because of each man in his own place doing his best for the general good of the whole.

Our Association can succeed only when its members can work as a team for the common good. This does not mean that there is no chance for a difference of opinion among the members. Honest differences should and must occur, but there can be no question as to the one desire for success. There is no greater incentive to effort than constructive criticism. There can be no heavier drag put upon effort than needless fault-finding. The success of any movement depends upon the coordinated action of all of the component parts. An army requires more than its officers to win a battle. The factory needs more than its superintendents to succeed. A railroad needs more than its president and managers to be a success in transportation. Every organization must have a head, but a head without a *good* supporting body would be of little value.

The future of our Association is what we, the members, choose to make it; we have grown from six active members at our first meeting to a membership of more than one hundred in thirty years. Not a phenomenal growth, but a good healthy growth *in size*. Have we grown proportionately in our influence upon the profession and the well-being of the state; shall we be content with the accomplishments of the past or, shall we take courage from such accomplishments and press on to greater things? There is more need for extra care and courage—for more enthusiasm and hard work today than there was in 1894. The changed conditions of our live stock production, the increased use of motor transportation, the vast increase in our urban populations and the greatly increased value of our food-producing animals, including all from chickens to cows, has changed the whole field of general veterinary practice. All of these things have changed the general outlook of the farmer and have caused him to know the value of care of his live stock.

The farmer has had to learn that the "horse doctor" has gone and that the veterinarian who can advise him about all of his

animals has taken his place. The field for veterinary service has changed and is changing, the demand is as great today as it ever has been for qualified, well-trained men. We have passed through a period of great changes, both economic and social, the whole world has been "upside down" and it is not to be wondered at that our profession has felt the shocks of these changes. As I see it, the whole future is bright with promise, but we must not leave things to chance.

"Chance will not do the work, Chance sends the breeze
But if the pilot slumbers at the helm,
The very wind that wafts us towards the port
May dash us on the shelves.
The steersman's part is vigilance
Blow it rough or smooth." (Sir Walter Scott)

Now, I will not presume to say what each one's part should be, but this is sure,—unless each member of this Association is willing to assume a part and do it, the prophet's work is easy. If each one will do his "bit," the future is so promising that it would seem to be an inspiration to action. What helps one helps all—unselfish effort always brings its just reward.

Our Secretary complains that it is not possible to get the members to help with our programs. I know what his troubles are for I have experienced them. Are you doing your bit to help the profession by helping to make our Association a success or are you hoping to get something without effort? As one who has served long, may I speak to the younger members a word of advice and admonition. The old order passes away, you must take the place that we have filled, and unless you improve upon what we have done, you will be a failure. Every man is held accountable for his opportunities. The educational advantages of today, the achievements of others in the past, the very failures of those older men who knew not but did the best they knew, places upon you responsibilities and obligations as great or greater than they ever had. Will you meet them or will you let the efforts of the older men be but pleasant memories? Our Association has been an inspiration to every man who has joined it, but are we getting all out of it that we should? A man can get out of such an association just what he puts into it and *no more*. We enjoy our social gatherings. We enjoy our banquets with their bright post-prandial talks engineered by our versatile State Veterinarian. But, is that the whole of our duty? *If* we

get behind our hard-working Secretary and the other officers and do what we can to put on our programs and increase our membership and do all that we, each of us, can to make our meetings go, the future of our Association is assured.

See America First via Great Northern

WISCONSIN VETERINARY MEDICAL ASSOCIATION

Dr. O. H. Eliason, secretary of the Wisconsin Veterinary Medical Association, announces that the summer meeting of the Association will be held at Eau Claire, July 14-15-16. That this meeting will be well worth attending is guaranteed by Dr. Thos. Wrigglesworth, the chairman of the local committee, the man who extended the invitation to meet in that beautiful city. He is making arrangements to secure interesting clinical material for the demonstrations and is planning some exceptionally good entertainment features. A detailed program will soon be ready for distribution. Any veterinarian interested will be sent a copy upon request.

ON THE WAY TO PORTLAND

North Dakota Agricultural College buildings, Fargo.

DEMODECTIC MANGE OF THE GOAT AND ITS TREATMENT*

By JOHN G. HARDENBERGH
and
CARL F. SCHLOTTHAUER

Division of Experimental Surgery and Pathology,
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Mange of the goat, caused by the hair-sac mite (*Demodex folliculorum*), is probably rare, especially in the United States. However, it may be that its recognition is more rare than its occurrence. The slight damage to the skin caused by this parasite, as compared with the serious damage by similar infestations in the dog, may be the reason so many cases are overlooked.

Cram[1] cites what is believed to be the first case of demodectic mange of the goat reported as having occurred in the United States. The paper contains a description, with photographs and drawings of the mites and a review of the literature, and was based on material submitted to the Zoological Division of the Bureau of Animal Industry from a case in this locality.

Since June, 1924, we have had under observation two cases of the disease in goats, and have observed the development of a third case in the same herd. The first two cases have responded extremely well to treatment.

REPORT OF CASES

In March, 1924, the wife of a local physician who has owned two grade, milk goats for several years purchased two pure-bred Toggenburg does from a fancier in St. Louis. At the time of receipt, the animals were in a rather unthrifty condition, but it was decided to keep them. Early in May, the owner, while grooming the new goats, noted a number of small swellings or nodules in the skin; they were especially numerous on the shoulders and sides; there were a few on the head and neck and along the back.

The owner opened some of the nodules and sent the almost dry, cheesy, yellowish-white material to the Veterinary Division of the Iowa State College and to the Bureau of Animal Industry,

*Read before the twenty-eighth annual meeting of the Minnesota State Veterinary Medical Association, Minneapolis, January 15, 1925.

at Washington. Replies were received from both places to the effect that the material consisted almost entirely of masses of demodectic mange mites, and that the condition was considered incurable. The Bureau suggested that if the animals were disposed of, it would like to receive the hides for study.

We were asked to see the goats in June when the process was thought to be at its height. The older of the two does was most extensively affected, with forty or fifty nodules in the skin along the neck, shoulders, sides and back. These nodules varied in size from 0.3 cm. to 1.25 cm. in diameter and could be recognized by running the hand lightly over the skin; the hair-coat itself was not sufficiently damaged so that the condition could be recognized by sight alone. The younger of the does had about twenty nodules. There was only slight itching.

A few of the nodules were opened and evacuated, and the contents examined microscopically, confirming the previous findings. It was possible to rupture a few of the swellings by pressure alone, but others required lancing to release the contents. There was practically no loss of hair, even over the nodules themselves. It is apparent that this variety of demodex mite does not infest the hair-follicles so much as it does in the dog, but congregates in the sebaceous and other glands of the skin; there is, therefore, no appreciable loss of hair.

The owner had already applied a lard and sulphur compound and a tar ointment, but such applications could not penetrate far enough to destroy the mites.

It was decided to open all the nodules, empty and destroy the contents, inject a few drops of 10 per cent carbolic acid into each sac, and paint the immediate area with iodin. This treatment was used because hair-follicle mites are killed in about a minute by 10 per cent phenol solution. Owing to the closely circumscribed character of the lesions, it seemed reasonable to suppose that few mites would be outside the sacs, and that most of those in the sacs would be reached by the phenol.

The treatment was thoroughly carried out. About three weeks later only the remnants of two or three nodules could be found. Healing had taken place so that the previous site of the nodules could not be found.

At the present time, more than six months after the treatment, there has been no recurrence of the condition and no trace of the previous lesions. However, the condition progresses so slowly

that several more months or a year must elapse before it can be determined that the cure is complete.

In November it was found that a third goat from the herd had acquired the disease. It seems that this doe, when confined in the goat-shed, butted and rubbed her head against the bar partition which separated her from the Toggenburgs. The owner first noticed one or two little patches on the side of the jaw in the form of a serous exudate and crust formation. From the description of the lesions it appeared that the infestation was manifesting itself more as a squamous type of mange, and it was impractical to apply the treatment used for the other goats.

Closer examination of the goat revealed a few patches on the face and head and two or three on the sides and back. In her determination to get rid of the infecting mites, the owner had applied various remedies which obscured the actual condition and made it difficult to decide the stage of the disease. However, it is believed that if the diseased areas had not been molested, they would have resolved into nodules as in the original cases. The pus in one of the lesions, however, was thin and gray, as compared to the firm cheesy material in the first cases and, had not the presence of demodex mites been demonstrated, the lesions of the third case could very well have been taken for those of non-parasitic acne.

Discussion

The source of infection of the primary cases is not known. After observing the slow development of lesions, it seems certain that the Toggenburgs were infected before the present owner acquired them. An interesting feature regarding the spread of the disease is that a kid, born to one of the Toggenburg does in the spring and confined with the infested does, has shown no evidence of infection to date, whereas a mature, grade doe, kept either in a separate pasture or in a pen adjoining that of the other does, acquired the disease. This agrees with the observations of others who assert that only grown animals develop nodules. One of the primary cases was in a pregnant doe; the other two cases were in non-pregnant does, which is at variance with the opinion of some observers who believe that the disease is more common in pregnant animals.

Diagnosis of the condition, as we have seen it, is not difficult, but recognition of it may be delayed, due to the slight changes in the hair-coat, especially if itching is absent. That the layman

characterizes the contents of the nodules as "grubs" is not surprising; however, the shape of the expressed masses of mange mites depends entirely on the size and shape of the incision made in opening the nodules.

While demodectic mange may not actually affect the health of animals it does constitute a distinct ailment, and is a potential source of annoyance to the goat fancier. If recognized by prospective purchasers of milk goats, it may prevent sales. It is a communicable disease which renders animals unfit for interstate shipment.

Milk goats are becoming increasingly numerous in the live stock population of the country, and an increase in the incidence of diseases peculiar to these animals and a consequent increased demand for the services of the veterinarian in connection with them may be expected. Veterinarians are interested in the goat industry not only from the professional but in many cases from the breeder's viewpoint. So far as we know, none of the books or bulletins relative to goats mentions demodectic mange as a possible ailment. Textbook descriptions of the condition are very meager or lacking altogether, but all previous observers have agreed that it is incurable.

The cases reported here appear to be quite typical. The surprising feature is the manner in which the two Toggenburgs, originally infected, responded to the treatment. It will be interesting to see whether the disappearance of the lesions is permanent. The treatment outlined is not claimed to be infallible; indeed, unknown factors may have entered into the cures, if they may be called such. However, the method is practical, rational and believed to be worthy of further trial.

If the occurrence of the disease is as rare as it is thought to be, it would seem that imported goats should be inspected for any evidence of the condition on admission, inasmuch as imported animals may be the chief source of infection in this country.

AUTHORS' NOTE: The goats were last seen on May 29, 1925, practically a year since the original cases were observed. There has been no recurrence of the disease in the original cases and no new cases have appeared aside from the one mentioned.

REFERENCE

[1]Cram, Eloise B.: Demodectic mange of the goat in the United States. Jour. Am. Veter. Med. Assn., lxvi (1925), n. s. 19 (4), pp. 475-480.

Portland—July 21-22-23-24—Plan To Go!

CANINE DISTEMPER

By F. G. STEINBACH, *Wildwood Crest, N. J.*

If, by the term "canine distemper," is meant a contagious disease of dogs involving the respiratory and alimentary tracts I have never seen a case. The term as generally applied is a cloak for ignorance and, to a variety of conditions in dogs, in which there is rapid breathing, purulent discharges from eyes and nose, elevated temperature and eruptions of the skin, the diagnosis "distemper" usually is made.

To say that a contagious influenza of canines does not exist would be rather a bold assertion, in view of the fact that it (influenza) exists in humans, horses and other mammals, but I do contend that if such a disease exists in the dog it is extremely rare in this country. Every method employed by me to transmit the disease from one animal to another has failed.

The most common condition in dogs, generally referred to as "distemper," is due to numerous causes, the most common of which is improper feeding. It seems that "distemper" is an old English term, formerly applied to human ailments. In the story of Robinson Crusoe it is frequently mentioned. Personally, I avoid the use of the word as much as possible and never use it in making a diagnosis.

While pneumonia is not an uncommon sequel to the disease I am sure it is not as common as I would be led to believe, from hearing clients report frequent diagnoses of pneumonia by their veterinarian at home. Being located at a seashore resort affords me an opportunity of hearing the various instructions different veterinarians give to clients concerning the feeding of dogs. People often tell me that every doctor gives them a different method of feeding a dog. Of all subjects or problems with which a veterinarian is concerned I think I have devoted more time, thought and worriment to that of animal feeding, especially of carnivorous animals.

One often hears the question asked by veteran dog breeders, "How is it that the pup with distemper which is given the most careful nursing will die, while the scrub or poorer one in the litter, left in the corner to die, will more frequently recover?" The answer to that question is that bad nursing is worse than no nursing at all. One often hears of the practice of feeding raw

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eggs and milk and ground raw beef to sick dogs. If he refuses this, it is often poured or injected into the poor fellow and when he dies both doctor and owner are consoled by the fact that "all was done that could be done."

The symptoms are too well known for it to be necessary to enumerate them and they are frequently so varied in different individuals as to suggest entirely different ailments. Eating garbage, or carrion, or the feces especially of chickens and cats, frequently produces symptoms similar to, but usually more acute than those produced by a poor system of feeding.

One condition frequently met is a severe dyspnea, due to toxins acting on the respiratory center, and I think it is responsible for the too frequent diagnosis of pneumonia being rendered. A gastro-intestinal irrigation usually cures the "pneumonia" in a half-hour, but I have met with cases that complete gastro-intestinal irrigation does not relieve. These cases usually die within twelve hours and on autopsy no macroscopical pathological lesions are found other than those of suffocation and edema of the lungs. Such cases are comparatively rare and invariably sequels of digestive disturbances, excitement and hot weather.

The treatment of the conditions generally referred to as distemper depends on the cause. Where the condition exists in kennels and is due to wet, sloppy feed, as rice, liver, bread soaked in soup, or corn meal, correcting the diet is usually all that is necessary, but the veterinarian usually is not called until one of the animals is suffering from an acute attack secondary to the subacute or chronic gastro-intestinal catarrh. Because pneumonia, bronchitis, eye and nasal discharges accompany this malady, some have looked on the disease as a contagious one. Like roup in chickens, it is merely a lowered resistance on the part of the dog, with the consequent increase in numbers and virulence of organisms normally present in the gastro-intestinal and respiratory tracts.

A few (four or five) years ago, in an effort or experiment to vaccinate chickens against pox, I ground in tap water some of the pox, sores and cheesy nodules of diseased birds and inoculated both healthy and sick birds with the unattenuated material by three different methods, namely, feeding, scarification and hypodermic and intramuscular injections, with no apparent beneficial or harmful results.

I have noticed that bantams, inbred and late hatched chicks from mash-fed stock are by far most susceptible. Garbage

feeding, of watermelon, cantaloupe and other acid food, is especially conducive to roup or pox in chickens.

I mention this in connection with "distemper" in dogs because I am positive that both diseases, which are regarded as contagious, are not so, but merely lowered resistance as a result of improper feeding. Since feeding is so closely associated with this topic I will offer some suggestions on feeding dogs, in the hope that it may stimulate a discussion, in which there will be an exchange of experiences and ideas on this very important subject, which is or has been considered too commonplace for scientific men to devote much time to it.

Much work has been and is still being done in a special line on nutrition and much valuable information has been gained on the subject of those mysterious substances known as vitamins and now a "mineral salt" wave is spreading among stockmen.

Most of us have read much of these things, but the principle which I would especially emphasize at this time is *dryness*. Next to variety I would say that *dryness* is the keynote to successful dog feeding. The frequent use of wet, sloppy or soggy food is the most common cause of trouble of which I know. Of course, eating carrion, garbage, etc., containing toxic material, will more commonly cause acute ailments. While there is no hard and fast rule for feeding, a few things might well be observed in feeding all dogs, whether well or sick.

Some things that should never be included in a dog's diet are as follows: Fish, clams, crabs, lobster, oysters, veal, cured ham, bologna, half smokes, cake, candy, ice cream, soup, broth, gravy (especially that of chicken or lamb), chickens, or other birds, liver and other sloppy or soggy food, as mush, oatmeal, rice, scrapple, and greasy food.

The practice of cooking meat scraps with mush or pouring the liquor over bread, rice, etc., is common and is about the worst kind of stuff to feed a dog or anything else. It is wonderful how long some dogs get by with that kind of food but it will eventually finish them. Prepared dog cakes are not so bad, but a properly mixed home-made diet is far better and cheaper.

I generally advise about one part lean cooked meat, with two parts vegetables and ten parts bread. This rule is not a hard and fast one, but I give it, as I generally regard it as approximately the right proportion. The vegetable should vary as much as possible. Generally the leaves of plants are more desirable than the roots. If roots are given they should always be mashed fine.

The same might be said of peas or beans, as dogs cannot digest the cullulose covering of beans or peas. Beans, peas and roots are better omitted in cases of digestive disorder.

To this diet should be added fruits in small quantities, the greater variety the better. Fruits as well as vegetables can be given either cooked or raw. Raw lettuce, celery and cabbage are alright. Milk occasionally is alright for well dogs. Completely turned sour milk is good. If one intends to feed bread and milk it is better to feed the milk alone and the bread alone. In using canned milk I prefer to dilute it with twice as much warm water. Milk should never be fed to dogs suffering with any of those conditions usually referred to as distemper, or in any case of toxic gastro-enteritis, as milk, like soup and broth, forms a wonderful culture medium for those saprophytes living in the alimentary canal in such conditions.

In rearing orphan puppies it is much better to allow them to suck the milk through a nipple than encourage them to drink milk. They should, however, be taught to eat dry food and suck on a big piece of raw beef as early as possible.

The question arises, "Why feed dry?" We should feed dry in order to stimulate a greater flow of saliva. But why stimulate the saliva when we know that the ptyalin in a dog's saliva is so feeble that it is of not much importance in digestion of carnivorous animals?

For the reason that the secretory glands of the entire gastro-intestinal tract are all under the same nervous control and when we start the saliva we start the whole secretory apparatus into action. It is for that reason that if you feed a pup a quarter-pound of lean raw meat on a big bone, he can gnaw it off and digest it, while the same quantity in the form of Hamburger steak might cause indigestion.

It is for that reason that if milk is fed it should not be poured over bread, but the chewing of the dry bread helps the secretory flow to insure better digestion. It is for that reason that a young orphan pup can digest milk that he sucks through a nipple better than if he drinks it. It is for that reason that dry food is so much better than wet or sloppy food. He must moisten it with the saliva in order to swallow it.

It is for the same reason that a wolf can live on almost an exclusively meat diet in the wild state, while those in zoological gardens are often sorry, scorbutic specimens. The wolf salivates profusely in the chase. Then the kill and the tearing of the hide

causes copious secretion of saliva and, by the time he tears and shreds the bulky muscles or meat, there is a great supply of gastric juice ready to attack the meat as soon as it is swallowed.

Of course, in sickness, we cannot lay down hard and fast rules, as the conditions vary. For instance, where there is excessive acidity we must feed sparingly of vegetables. We often have to feel our way, observing the effect of certain foods, for what agrees with one often does not agree with others, and there are times when we have patients that apparently cannot digest anything but possibly bread and butter and sometimes not even these.

My most common retreat is to bread and butter and then cautiously venturing on meat and other things. If bread is broken in pieces, a dog will not lick the butter off as easily as when you hand him a slice. When a dog cannot digest this, which is comparatively rare, then I retreat to predigested foods, as Panopepton or Mulford's Predigested Beef. Diluted milk, in very small quantities, to which pepsin (elixir lactated pepsin) has been added, might be acceptable in some cases.

Often a pup in a very low state of nutrition can digest raw meat from a bone, like a neck bone or shoulder blade from which every particle of fat and loose splinters of bone and all cartilage have been removed. The bone should have almost no meat on it. Let him work on it for an hour or so and in that time if he gets only a teaspoonful of meat he can usually digest it.

In using predigested food I usually allow a half-tablespoon to two tablespoonfuls (depending on size of pup) to remain spread in a dinner plate for ten or fifteen minutes, to allow the alcohol to evaporate, as the alcohol irritates the dog's nose and he sometimes refuses to lap it. Of course never stand it in the sun and never heat it. Clients will often do this unless advised differently. Sometimes it is necessary to keep a pup on predigested food exclusively for two or three days, venturing cautiously on bread, vegetables, meat and even fruit. It is well to try one thing at a time and, as we find things agree, gradually increase quantity and variety.

Most people agree that potatoes should never be fed to dogs and some veterinarians say potatoes or any other starchy material should never be fed. This is ridiculous, as starch is an essential part of any balanced ration. The reason potatoes often do not agree with dogs is because dogs swallow the pieces whole, and they are too wet and soggy when fed alone and especially when fed cold, as is often the case, since the dog is

usually fed last. A little fresh-boiled warm-mashed potatoes, when fed with bread, meat and vegetables, is good food for the average well dog.

COLLEGE NOTES

Dr. Victor G. Kimball (Corn. '18), of the University of Pennsylvania veterinary faculty, was recently confined to his home on account of illness.

Dr. John W. Patton (Tex. '21), professor in poultry husbandry, Massachusetts Agricultural College, is planning to spend the summer in study at Columbia University.

Dr. W. G. Hollingworth (Amer. V. C. '84), of Utica, N. Y., gave a talk on "Municipal Meat Inspection," at the New York State Veterinary College at Cornell, May 21.

Miss Gladys Schoenfeld and Robert H. Volgenau, members of the senior class, N. Y. State Veterinary College, were two of the six Cornell University undergraduates who were elected to the Honorary Society of Sigma Xi this spring.

Dr. Chas. S. Chase (N. Y.-Amer. '06), president of the New York State Veterinary Society, addressed the senior class of the New York State Veterinary College at Cornell, May 22, on "Jurisprudence." Dr. Chase also attended the initiation dinner of Phi Zeta, while in Ithaca.

The twenty-six senior veterinary students of Iowa State College were the guests of the Fort Dodge Serum Company, May 27, 1925. They drove from Ames to Fort Dodge, accompanied by Professors Benbrook and Rice. The morning was spent in an inspection of the plant and laboratories. Luncheon was served at the Wahkonsa Hotel, at noon.

Dr. Lee M. Roderick (O. S. U. '15), of the North Dakota Agricultural College, has been awarded a Fellowship, at the University of Chicago, by the Institute of American Meat Packers. Dr. Roderick has secured a leave of absence from the North Dakota Agricultural College and will start work in Chicago with the summer quarter. He will do work in bacteriology and pathology to apply toward the degree of Doctor of Philosophy.

THE USE OF POTASSIUM PERMANGANATE IN THE DRINKING WATER FOR POULTRY

By SIVERT ERIKSEN, *Pathologist*

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Potassium permanganate has been widely used by poultrymen as a purifier of the drinking water. Frequently articles appear in various journals and questions are asked in meetings and by correspondence indicating a very confused state of information as to the value and limitations of potassium permanganate, as well as other drinking-water purifiers. The necessity of finding the correct answer to the following questions lead us to conduct the experiments herein reported. How long is potassium permanganate effective after being put in drinking water? How does potassium permanganate compare with other drugs in antiseptic value? Is the constant use of potassium permanganate harmful to fowls? May potassium permanganate be used in the water when sour milk is fed?

THE EFFICACY OF POTASSIUM PERMANGANATE AS A PURIFIER OF DRINKING WATER

Method of Procedure: Potassium permanganate in dilutions of 1:2000, 1:3000, 1:4000, 1:5000, 1:6000, 1:8000 and 1:10,000, put in glazed-crock containers, was placed in a pen of twenty-five half-grown chickens. At intervals of twenty minutes, four-, six-, twenty-four- and forty-eight-hour samples were collected by means of sterile pipettes, placed in sterile bottles and immediately taken to the laboratory, where cultures were made on agar plates. At the end of twenty-four and forty-eight hours the colonies were counted and the number of bacteria per liter of water computed for an average of all counts. Thirteen trials were made and thirty-five samples were cultured. Unmedicated water, kept under identical conditions, was cultured as a control each time.

Results: In a dilution of 1:2000 potassium permanganate yielded growth of one colony in one plate only, from samples taken at the end of twenty minutes. Cultures taken at the end of four and twenty-four hours were sterile.

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In another experiment on the same dilution, tests taken at the end of six hours yielded one colony on three samples plated. Three cultures taken at the end of twenty-four hours yielded two, none and three colonies respectively. Three cultures at the end of forty-eght hours yielded two, three and four colonies respectively. Other dilutions, up to and including 1:6000, gave practically identical results. Dilutions of 1:8000 yielded four colonies on three plates at the end of six hours, eleven colonies at the end of twenty-four hours, and fourteen at the end of forty-eight hours. Dilutions of 1:10,000 yielded eleven, two and forty-seven colonies from samples identical to the above. Controls yielded from sixty to innumerable colonies on each plate.

Table I gives the average number of bacteria per liter for the various dilutions of potassium permanganate.

(Twenty-minute and four-hour cultures have been omitted, because they did not differ materially from the six-hour cultures.)

TABLE I—*Bacteria per liter in various dilutions of potassium permanganate.*

DILUTION	CULTURES TAKEN AT THE END OF		
	6 HOURS	24 HOURS	48 HOURS
1:2,000	0	Sterile	0
1:2,000	166,666	533,333	733,333
1:3,000	700,000	933,333*	Innumerable*
1:4,000	Sterile	550,000	33,333
1:5,000	100,000	4,083,333*	Innumerable*
1:6,000	33,333	383,333	312,500
1:8,000	383,333	666,666	2,183,333
1:10,000	400,000	183,333	2,016,666
Control	146,166,666	64,500,000	0

*Excessive straw and other organic matter.

It is important to note that potassium permanganate practically prevents the growth of bacteria in open vessels, in dilutions as low as 1:6000, for a period of forty-eight hours, if the water is kept free from excessive contamination of organic material. Contamination is avoided by placing the vessel on a platform or box where litter or feed are not scratched into it. Sunshine had no appreciable effect on the efficiacy of potassium permanganate. Samples which were contaminated with either straw, food or droppings soon lost the characteristic purple-wine color and a rise in bacterial count immediately followed. One of the outstanding virtues of potassium permanganate is that the loss of potency is immediately indicated by a change of color.

A good purple color indicates that the potassium permanganate is active, regardless of the length of time it has been exposed.

A Comparison of Potassium Permanganate with Other Common Drugs

A comparison of the efficacy of some common drugs is found in table II. The same technic as described for the experiment on potassium permanganate was used. The crocks containing the medicated water were placed on a long table in the poultry-house, where likelihood of contamination would be equal for each drug. Chlorinated soda 1:100, copper sulphate 1:1000, iron sulphate

Table II—*Average number of bacteria per liter at end of twenty-four hours.*

Drug	Dilution	Bacteria	Remarks
Acriflavine	1:166	183,333	Higher dilutions gave heavy counts
Boric acid	1:100	0	20-min. and 4-hr. cultures yielded 92,500,000 and 15,500,000 respectively
Carbolic acid	1:1,000	583,333	Many types of bacteria with staphylococci predominating
Catechu, fluidextract	1:1,000	39,650,000	
Chlorinated soda	1:100	566,666	All Gram-positive staphylococci
Compound cresol	1:1,000	7,933,333	*B. coli* test positive
Copper sulphate	1:1,000	83,333	*B. coli* test negative, staphylococci predominating
"H. W."	1:1,000	168,233,333	
Iron sulphate	1:1,000	216,666	Molds predominating; small staphylococci
Mercuric chlorid	1:10,000	166,666	Gram-positive coccus; only one colony on high dilution plate
Potassium dichromate	1:2,000	3,613,333	Staphylococci predominating
Potassium permanganate	1:8,000	666,666	*B. coli* test negative
Sterilac	1:3,000	166,666	
Sulphocarbolates	30 grains to the liter	483,333	Earlier counts ran higher
Zonite	1:100	Sterile	Earlier counts ran very low
Control	Tap-water	64,516,666	*B. coli* test positive. Many plates had innumerable colonies

1:1000, zonite 1:100 and sterilac 1:3000 were quite satisfactory as well as practical.

All samples developed heavy bacterial growths when water was allowed to become contaminated with litter.

The Effect of Potassium Permanganate on Growing Chicks

It is often thought that potassium permanganate is injurious to poultry, when used continuously. Some poultrymen have ascribed blindness and others have attributed lameness to its use.

Twenty White Leghorn chicks, three weeks of age, were offered water containing one-quarter of a teaspoonful of potassium permanganate per gallon (1:2000). This treatment was continued for nine weeks, at the end of which time only one chick had died. All the others developed in a normal manner. As young chicks are particularly susceptible to adverse conditions, this experiment, together with the one using potassium permanganate in connection with sour milk, leads us to the conclusion that potassium permanganate, even in much stronger solutions than necessary for water purification, is harmless for poultry.

Physiologic Compatability of Potassium Permanganate and Sour Milk

The belief that potassium permanganate produces a poisonous substance when fed in connection with sour milk seems to be more or less prevalent among poultrymen, judging from the number of inquiries received at the Missouri State Poultry Experiment Station.

Inquiring poultrymen usually quote their druggist as authority for the statement that combinations of potassium permanganate with sour milk will produce a deadly poisonous substance. A search through the ordinary text-books on chemistry and pharmacology has failed to furnish evidence of such toxin production. Nevertheless, it was deemed advisable, in order better to answer inquirers, to note, under actual feeding conditions, just what would happen when the two substances were fed simultaneously.

The experiment, as outlined in table III, was undertaken with mature hens. Sour milk and a 0.2 per cent solution (1 part in 500) of potassium permanganate in equal amounts were introduced directly into the crop. Similar amounts were also mixed and allowed to stand for one hour before being fed.

Four doses were given at weekly intervals in amounts equalling one hundred cubic centimeters to each bird. No ill effects of any kind were noted in these birds. Number 4318 died from causes other than that which would be ascribed to the treatment.

TABLE III—*Potassium permanganate and sour milk given by individual treatment.*

SPEC.	BAND	TREATMENT		DATES OF TREATMENT REPEATED			RESULTS
		.2% KMnO,	SOUR MILK				
4316	686		25 cc	1–9	1–16	1–22	No untoward symptoms developed
4317	102	25 cc	25 cc	1–9	1–16	1–22	
4318	1707	25 cc	25 cc	1–9	1–16	1–22	Died 1–29—caseated, inspissated egg
4319	209	25 cc		1–9	1–16	1–22	No untoward symptoms developed
4320	2075	25 cc* mixed	25 cc* mixed	1–9	1–16	1–22	

*Mixed and let stand one-half hour before feeding.

Sour milk and potassium permanganate were placed before the birds in separate vessels for three consecutive days. At the end of nine days no untoward symptoms had developed.

Administration was made with a large pipette introduced directly into the crop.

The action of these substances on growing chicks was tested by feeding twenty chicks, four to six weeks of age, all the sour milk they would consume and by medicating all the water placed before them with one-quarter teaspoonful of potassium permanganate to each gallon of water (1:2000).

This experiment was continued for four weeks and no ill effects of any kind were noted. One chick died from lack of vitamin A in the ration.

From these experiments we feel justified in drawing the conclusion that the feeding of sour milk need not be discontinued when it is deemed necessary to use potassium permanganate in the drinking water.

These experiments were not conducted with pathogenic bacteria for the reason that the bactericidal properties of potassium permanganate, under test-tube conditions, are well known. We were interested primarily in establishing its value under actual pen conditions. As the presence of *B. coli* is considered a criterion for potability of water for human consumption, so the absence of

B. coli in medicated water may be considered as the critical test for the efficacy of the drug used.

Conclusions

1. Potassium permanganate is very efficient as a purifier of drinking water for poultry.
2. Organic material oxidizes it rapidly, but the change of color with oxidation makes it a self-indicator.
3. Potassium permanganate compares favorably with other drugs.
4. Growing chicks are not injuried by the use of potassium permanganate in strong dilution.
5. When used with sour milk, potassium permanganate does not produce harmful substances.

Checking up on Bossy

"Where you goin'?"

"I'm taking this cow up to the bank."

"What for?"

"To have her milk certified."—*Puppet.*

ON THE WAY TO PORTLAND

Second Avenue South and Seventh Street, Minneapolis.

THE HIGHWAY OF SERVICE*

By D. I. SKIDMORE,

Chief of the Division of Virus-Serum Control,
U. S. Bureau of Animal Industry, Washington, D. C.

On March 1, 1925, there were 91 establishments operating under a veterinary license. Of these, 57 produced anti-hog cholera serum and hog cholera virus only, 27 produced a wide variety of biologics other than those mentioned, while 7 produced both classes. During the calendar year 1924 these establishments produced a total of 766,251,213 cc of anti-hog cholera serum; 34,718,848 cc of simultaneous virus; and 21,898,975 doses of other biologics. These products represent a sufficient dosage to treat a large per cent of the animals produced during the same period, and emphasize the importance of their being properly prepared, worthy of use, and free from contaminating or disease-producing agencies.

The appearance of foot-and-mouth disease in California and Texas, in 1924, directed attention to the United States of all peoples in the world who are concerned in measures having for their purpose the prevention or control of infectious diseases. This situation resulted in the Bureau receiving suggestions for the prevention, control and even the cure of foot-and-mouth disease, which ranged from biologic treatment on the one hand to ceremonial treatment on the other, all of which were doubtless offered by people of good intentions. These outbreaks served also to revive interest abroad, not only in methods used by the United States Bureau of Animal Industry for eradicating foot-and-mouth disease, but stimulated interest in those activities of the Bureau along other lines such as the discovery of the cause of hog cholera and the development of the preventive serum treatment. Some in this country wished to import strains of foot-and-mouth disease virus from Europe for investigational purposes.

From time to time the Bureau has been importuned to admit both drugs and biologic products to be used in the treatment of the disease. On a recent occasion a vaccine was brought into the country with the hope of persuading the Bureau to use

*Read before the Biologic Section, American Drug Manufacturers' Association, New York N. Y., April 21, 1925.

it or give its indorsement thereto, as a preventive, treatment, or cure for foot-and-mouth disease. Knowing of the Bureau's work on hog cholera, blood of swine affected with a highly infectious disease in a foreign country was brought to the Bureau a few days ago and hope expressed that a way could be found to conduct experimental work with this and thus assist the authorities in the foreign country in discovering its character and in developing methods for its prevention. Of course, these materials cannot be imported in the regular way, and the Bureau cannot permit experimental work in this country with viruses of diseases not prevalent here.

Keep Foreign Plagues Out

As stated by Dr. J. R. Mohler, chief of the Bureau, the place to use and study these is in the countries where the diseases concerned exist regularly. We have consistently denied entry to anti-hog cholera serum and other serums produced from animals in foreign countries, which are susceptible to foot-and-mouth disease or other diseases not prevalent here, on account of the possibility that they may be carriers of such infections. Since the conclusion of the World War an unusual number of permits have been applied for to import products potentially dangerous, not only to the live stock industry but to those engaged in the production of biologic products. Of what value a service may be which controls these matters can only be surmised, since it is not possible for any one to know what the results would have been had importation been permitted.

In spite of the barriers mentioned and others, European fowl pest has been introduced into the United States, and an appropriation of $100,000 was made by Congress in 1924 for its eradication. Attention has been called to the fact that the only known introduction of the virus was in 1923. This was obtained from the Pasteur Institute of France by an investigator in a large eastern institution, who in turn supplied it to other investigators. The Virus-Serum-Toxin Act prohibits the importation of any worthless, contaminated, dangerous or harmful virus, serum, toxin, or analogous product, which is intended for the *treatment* of domestic animals, but is silent regarding those intended for other purposes.

In order to control the importation of all viruses, etc., which I have mentioned, the Bureau has cooperative arrangements with the customs authorities whereby products of this character,

when declared as such at the port of entry, will be inspected prior to clearance. This inspection is conducted by the Virus-Serum Control office of the Bureau having supervision over the region in which the port of entry is located. It appears that no greater service can be rendered domestic producers of biologics and live stock than to prevent the introduction of all diseases not now prevalent in this country.

Whenever foot-and-mouth disease or one equally contagious or dangerous endangers the live stock supply of a biologic establishment, it becomes necessary practically to close the affected plant, although products that have been heated properly, ordinarily may be marketed without indefinite delay and added expense. Serum and other products, such as aggressins, which are produced from animals susceptible to such diseases must, in case of an outbreak, be subjected to special requirements before the products can be marketed safely. Dorset and Henley of the Bureau have developed a satisfactory method for treating ordinary defibrinated blood serum by which the corpuscles are removed or the hemoglobin precipitated, which is known as the bean-chloroform method. In this procedure a considerable part of the phenol content is eliminated along with the precipitated hemoglobin, thus making it feasible to subject the product to heat at 59° to 60° C. for thirty minutes, in order that it may be made safe against the infection of foot-and-mouth disease.

Much Clear Serum Produced

A large percentage of serum, 24.73% of that produced in 1924, consists of the so-called clear product, which is prepared by treating hyperimmune blood with bean extract and saturated salt solution so that the corpuscles may be removed. A considerable portion of this serum is heated, at the time of its preparation, at the temperature just indicated and before any preservative is added. This product is permitted entry into the markets if the heating is conducted as required by the Bureau. If this class of clear serum is not heated before preservation there is no method known at this time whereby its phenol content may be reduced sufficiently to make it feasible to heat the product at the temperature indicated without injury to its potency, and thus, in case of an outbreak of foot-and-mouth disease which may endanger the live stock supply of an establishment, this product would be on a very unsatisfactory basis, probably resulting in great loss to the establishment or establishments

involved. It usually happens that a considerable quantity of serum and virus has been prepared between the probable time that foot-and-mouth disease was introduced and its discovery. This product is always one to be given special consideration, but if it has been heated according to Bureau requirements little delay and expense is encountered.

The refinement of ordinary anti-hog cholera serum by the bean-chloroform method also serves a very useful purpose whenever it becomes desirable to eliminate the corpuscles and thus procure the clear serum containing the antibody content in concentrated form. This method has been used successfully on considerable volumes of serum which otherwise would have been unmarketable. It is also applicable to the treatment of hyperimmune blood collected from hogs affected with tuberculosis. The yield procured by this method, when applied by skilled operators, approximates 78 per cent of the volume treated.

Blackleg Aggressin Made Safe By Heating

It has been determined that blackleg aggressin may be heated safely, for the purpose of insuring its safety against the infection of foot-and-mouth disease, in the same way that clear anti-hog cholera serum is heated, and there is no reason to believe that the same process cannot be applied successfully to hemorrhagic septicemia aggressin, although this procedure has not yet been approved for it. These aggressins, because of their origin, are potential dangers in an outbreak of foot-and-mouth disease, and it is of more importance to make them safe against this infection than in the case of either hog cholera virus or anti-hog cholera serum. This situation arises from the fact that aggressins are collected from animals which do not survive more than about 24 to 48 hours after injection with virus for production purposes, whereas virus pigs are under the observation of Bureau inspectors from 6 to 8 days after inoculation, and hyperimmune hogs are usually observed likewise for a period of several weeks after hyperimmunization.

Thus it will be seen that in the case of aggressin-producing animals the period of observation, subsequent to exposure a short time before injection, is too short for foot-and-mouth disease to manifest itself by clinical symptoms. It might occur, therefore, that these animals would be slaughtered and products produced during the incubative period of foot-and-mouth disease, which is generally believed to be the most infectious. How

essential it is to safeguard these products in an outbreak of foot-and-mouth disease will be apparent to all familiar with their character. It should be remembered that small quantities or batches may be distributed in practically every state of the Union, and if these prove to be worthless, or contaminated with pathogens, inestimable damage may result. It is always well to keep in mind that biologic products should be thought of in terms of doses rather than volume, and that if infective agents are present the damage is not and usually cannot be confined to single animals or to herds, and frequently not to communities.

Millions Saved Through Inspection

Although no one can evaluate the service rendered under the law, some measure of the value of having a supply of pure and potent products available may be gained from estimates for a single year, pertaining to one product.

1. In one year 9,000,000 cc of anti-hog cholera serum was destroyed because it failed to meet Bureau requirements. If this serum had been used simultaneously with virulent virus, the direct losses together with those due to the spread of disease from the herds primarily infected would have been large. The value in hogs conserved by denial of the use of this rejected serum is estimated as approximately $4,000,000.

2. As a stimulus to producers of swine under certain conditions and in many localities the mere fact that pure and potent products are available has meant millions of dollars to the swine industry alone in one year's time. A conservative estimate of this factor has been placed at over $4,000,000.

3. Without the products being available it would, of course, be impossible to conduct the stock hog business on its present scale, and it is estimated that in one year there must have accrued from this protection a value of approximately $2,250,000.

4. Garbage has become a considerable factor in swine production, and without serum and virus it is obviously a hazardous undertaking, and for many would be impossible. Conservation of this food material during one year has been estimated to be worth at least $1,125,000.

These figures, although they are estimates, serve well as illustrations and show better than words can express some idea of the magnitude and scope of the results obtained by the availability and use of products in which the live stock industry may look with confidence for insurance and protection. The cost of this

protection is borne almost entirely by the user of the products. The cost of inspection, however, is covered by appropriations by Congress from year to year, and very properly so, since the live stock industry as a whole and many others benefit by the service rendered. It will be seen by the figures to follow that the cost would be nominal and justifiable even though the user himself paid the entire amount. During the fiscal year ended June 30, last, there was produced 879,421,500 cc of serum. Estimating the average dose at 40 cc, this represents 21,985,539 doses, or a sufficient quantity to treat a like number of animals. This was done at a direct cost to the Government of approximately 2 cents per 100 cc or about four-fifths of 1 cent per dose.

Cost of Inspection Very Low

The average cost for a period of eight years, from 1917 to 1924, inclusive, was a little over 3 cents per 100 cc, or 1.2 cents per dose. In short, the cost to the Federal Government, per animal treated, during the entire period of eight years, has been about 1.2 cents each. The cost of inspection of anti-hog cholera serum per 100 cc produced in the past three years has been only 68.38 per cent of the average for the years preceding. Stated in another way, the cost to the Federal Government has been reduced 31.62 per cent, when the volume of serum produced in former years, with the attending cost, is compared with the volume produced in the past three years and its cost. The cost of inspection applied to products other than anti-hog cholera serum and hog cholera virus cannot be given, but, of course, has been very small and not on a comparable basis with that for serum and virus inspection.

Some have said that greater interest is taken in the protection of our live stock than of people, that liberal appropriations are made cheerfully to safeguard the health of animals, whereas such are denied for use in safeguarding the health of children, and that the economic welfare of cattle, sheep, swine and poultry, it may be presumed, is of more interest and importance than the welfare of humanity. Statements of this character have been made by those obviously of good intentions, but whose enthusiasm for welfare work apparently has been exceeded only by their lack of knowledge of conditions and facts. Is it for the comfort and welfare of the hog that we immunize it against hog cholera? Is it to alleviate the suffering of cattle that we protect them against blackleg and hemorrhagic septicemia?

Do we inject dogs with rabies vaccine from humane motives and for its inherent benefit to the dog? Those of us who are engaged in work which makes possible these things know that the stimulus which inspires men to devote their lives to the protection of animals against the ravages of infectious disease lies deeper than these.

We serve and promote the welfare of men, women, and children and contribute to the happiness of humanity by providing a way for the accomplishment of the things which aid in conserving the live stock industry. We have witnessed practically the annihilation of herds or flocks through preventable diseases. We have seen men who depend for a living and the support of their families upon the income from their herds or flocks suffer such losses as to be calamities in themselves. This is a calamity witnessed too frequently and is all the more regrettable because preventable. It would be useless to hazard a guess as to how many of these calamities have been prevented by the protective measures developed and applied through the service of those engaged in animal disease control work in all of its many ramifications and phases.

Many Problems Await Solution

The producer of biologic products of proven value may well feel a personal pride in the part which he takes in this service. The practitioner has a great opportunity to serve and usually grasps it. Regulatory officials of the several states and of the Federal Government contribute no small service in this respect, while the investigator in whatever capacity has a wonderful opportunity to serve mankind. There yet remains much to be done and many problems to be solved before we can render the service so much to be desired, and as an aid in this direction the Bureau has found it beneficial sometimes to supervise experimental work which biologic producers wish to conduct, preliminary to obtaining a license for the manufacture and distribution of new products, or with the view of modifying methods of production of an old product. This is a service that frequently can be furnished them without great cost to the Government and conserves funds which it otherwise would have to spend in order to determine the merits of proposals. Supplemental tests, however, are made as circumstances seem to warrant and as funds will permit.

If, by our collective activities, we enable men to save their

herds and flocks we surely contribute to a higher standard of living for them, make it possible thereby for them to educate their children, and to provide the many essentials to their welfare. A family whose source of income is protected from the ravages of disease is thus enabled to serve its community in a larger capacity and is a greater asset to the country than would otherwise be possible. Good health is of prime importance to everyone. It is the one thing upon which all else is predicated. No one of sufficient age to reason and make comparison will deny this fundamental fact and none are so constantly reminded of the need for liberal provisions being made for this purpose as are those who, for one reason or another, have experienced attacks upon their health, but it avails nothing toward accomplishment of these things to under-rate the efforts made for the control of animal diseases.

Human Welfare Foremost Consideration

The control of these diseases is second only in importance to the welfare of the people themselves who are engaged in live stock production. The millions of people who obtain their living through the production of live stock must have this source of income protected in order to enjoy such health as they possess, so that the two may contribute to well-rounded living. Billions of dollars invested in live stock must be protected if the health of millions of men is to give them the full fruition of their labors. Not only that, but millions must be fed and clothed and these millions reap the benefits accruing from a service which conserves to them a liberal meat and milk supply and ample raw materials for clothing and innumerable articles produced as by-products.

Full measure of the service rendered by the administration of the Virus-Serum-Toxin Act and the benefits which accrue therefrom may not be stated in figures or demonstrated concretely in any form, but it is hoped that this review will prove useful in making clearer its far-reaching benefits. It is hoped that we may serve every biologic producer to the fullest extent, but we want this service to be such that it will extend beyond producers and on beyond the animals to be treated with their products so that it may reach into the home of the farmer, thus affording him and his family a fuller, richer life, and into the home of the consumer, enabling him to enjoy thereby the benefits of an adequate and satisfactory supply of food products and many other necessities.

THE DIAGNOSIS OF BACILLARY WHITE DIARRHEA IN BABY CHICKS

By J. B. TAYLOR

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During the spring months every year the Animal Health Laboratory of South Dakota State College receives many baby chicks in which evidence of bacillary white diarrhea is suspected. Various diagnostic methods have been tried with varying degrees of success. An autopsy alone is not satisfactory. A microscopic examination of smears from the heart-blood or from the liver is equally unsatisfactory, because *B. coli* and other Gram-negative organisms may readily be mistaken for *B. pullorum*. After various attempts to develop a more satisfactory diagnostic method, the following procedure was developed. It has been found rapid, easily applicable and accurate for routine examination, especially where many chicks are examined every day. It is presented with the hope that other workers may avail themselves of its advantages.

Chicks are opened to expose the heart and liver. The surfaces of these organs are seared with a hot spatula and opened. Heart-blood and material from the liver are streaked with a platinum loop on solidified 2% glycerinated agar in Petri dishes. About eight streaks can be made on a plate. In twelve to twenty-four hours the smallest colonies which have a smooth, glistening appearance and entire margins are fished to agar slants and incubated. The growth is washed off the agar slants with normal saline solution, and filtered through filter paper to remove clumps. The filtrate is collected in a test tube and diluted so that it appears slightly opalescent. It is then carbolized (1 cc of 5% carbolic acid to 9 cc of antigen). Four cubic centimeters of this antigen is put in a test tube and one drop of a known positive serum, from a hen which has reacted to the agglutination test for white diarrhea, is added. The tube is shaken and incubated over night. Positive agglutination of the antigen is diagnostic of white diarrhea infection in the baby chick.

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CHLOROFORM ANESTHESIA FOR CATS BY THE CHAMBER METHOD

By C. H. SEAGRAVES,

Associated with JOHN F. RANKIN,
Astoria, Ore.

The chamber method of anesthetizing small animals, especially cats, is not new; the use of chloroform as an anesthetic for cats is also not new. In advocating the use of chloroform for cats by the chamber method we admit having had only a limited experience—about 50 cases—but the method has seemed so practical, at the same time without fatality, that we wish to submit it for the consideration of other veterinarians. The administration of chloroform as a general anesthetic for cats has been accepted with apprehension and the fact that we have been cognizant of its untoward effect, as reported by other observers, namely, circulatory failure, has kept us on our guard in its use. This may account for our satisfactory results, as a little overconfidence may change success into failure.

The veterinarian practicing alone, or lacking the necessary assistance for giving an anesthetic by restraint and the cone, will find this chamber method safe and very practical, we believe. It should appeal, indeed, to the few veterinarians who maintain the deplorable policy of having two prices for the castration of the male cat; $1.50 is the mere stipend without an anesthetic, or more with one. Recently a fellow dramatized to us how, in one of our exemplary veterinary hospitals of the West, his cat was castrated by the "blanket narcosis" method, with him holding the hind legs. It is the relating—he will continue to do so whenever the conversation permits—to his friends, of the story of how his cat was castrated, that is one of the factors tending to deprive the profession of much of this work. "This operation requires a general anesthetic, our fee is $3.00" is the customary answer to an inquiry concerning this operation and invariably the amount is satisfactory or the prospective client expected to pay more. And where is the lady who will not pay more to say that her cat has been anesthetized? When no less a plutocrat than a plumber was told our fee, he said, "Why I expected to pay at least $5.00." This is nearer what the fee should be, from a professional standpoint.

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The chamber, as shown in figure 1, is 18 inches long, 7½ inches wide and 11 inches high. It is made of 24-gauge galvanized iron, provided with a groove on each wall-end, to receive the glass ends. The glass is double strength and projects three-quarters of an inch above the top, as a hold to draw it out. The finish is three coats of prepared bath-tub enamel. It is very important that both ends be of glass, as small cats turn around and they must be watched closely. This chamber cost $5.25.

In examining the chart of the eight cats anesthetized (we regret that records were not kept during the year to include more) one will note that with two exceptions (cases 1 and 8) the operations

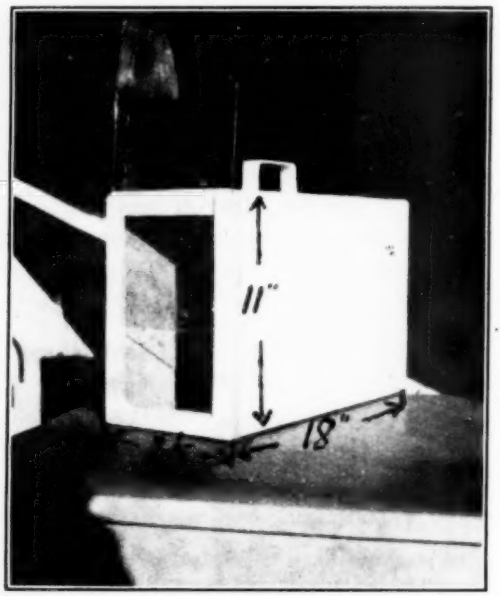

FIG. 1. Chamber for chloroform anesthesia.

were castrations. But, in any operation requiring a brief period of complete unconsciousness or stillness, this "flash anesthesia" is practical. A cone at hand, prepared with ether, will prolong narcosis if needed. When the patient falls relaxed in the cage and the reflexes are nearly absent, he should be withdrawn. In the presence of free air he will remain completely unconscious long enough for the operator to do a careful, clean castration and return the patient to his cage before gaining consciousness.

No attempt was made to determine the minimum amount of chloroform required, but in a chamber of this size on dram is a

lethal amount when the animal is left in for very long—a few seconds longer than the time required to narcotize. When the anesthetic was allowed to vaporize (cases 3 and 4) before the cat was placed in the chamber the time was less—approximately one-half as long as when the pledget of cotton, moistened with chloroform, was placed in the cage the same time the cat was. When ether and chloroform are used together, or ether alone, the time in anesthetizing is very much longer and the patient appar-

TABLE I—*Data on eight animals anesthetized by author's method.*

CASE	ANIMAL	AGE	ANESTHESIA	TIME REQUIRED (MINUTES)*	OPERATION
1	Female Cat	7 Mos.	One dram Chloroform	7	Ovarectomy, Narcosis was maintained with ether
2	Male Cat	3 Mos.	One dram Chloroform	14	Castration
3	Male Cat	3 Mos.	One dram Chloroform Allowed to vaporize for 5 minutes	5	Castration
4	Male Cat	4 Mos.	One dram Chloroform Allowed to vaporize for 5 minutes	6½	Castration
5	Male Cat	2 Mos.	One dram Chloroform	16	Castration
6	Male Cat	7 Mos.	One dram Chloroform and ether	17	Castration
7	Male Cat	11 Mos.	One dram Chloroform	9	Castration
8	Male Cat	1 Yr.	One dram Chloroform	9½	Surgical treatment of deep infection of leg

*Average time required to effect narcosis was 10½ minutes.

ently more sickened. One might contend that repeated inspirations of an anesthetic and expirations of carbon dioxid is dangerous. This has not been observed and is believed less dangerous than giving an anesthetic under fear and physical resistance.

In addition of anesthetizing we use this chamber for destroying cats and small dogs with chloroform. There may be more efficient

means of destroying animals, but the advantage will not warrant changing the public mind, so long as the popular opinion is that chloroform is the most humane method and is the one requested.

In concluding, it is our opinion that chloroform by the chamber method is a practical and reasonably safe anesthetic for cats when a brief anesthesia is required. It is imperative that the patient be constantly watched and when reflexes of limbs and tail have ceased that he be withdrawn from the chamber. In free air, without additional anesthetic, we have found that cats remain unconscious for as long as three minutes.

THOROUGHBREDS STILL ADMIRED

The interest still maintained in Thoroughbreds was reflected in the sale of the Nursery Stud of the late August Belmont, at Lexington, Kentucky, in May. Sixty-eight horses, all Thoroughbreds, and comprising one of the greatest collections of horse flesh ever assembled on any breeding farm, were sold for $782,000. Mr. J. E. Widener paid $100,000 for the 21-year old stallion, Fair Play. Sixty-five brood mares were sold at an average price of $9,861.50. The bidding on Fair Play, the sire of Man o' War, was started at $75,000, by Mr. Walter J. Salmon, who dropped out after bidding $95,000.

Multnomah Hotel, Portland. Official Headquarters.

ULTRAVIOLET LIGHT IN VETERINARY MEDICINE

By E. J. FRICK *and* J. F. BULLARD
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The purpose of this article is to explain and call to the attention of veterinarians the value of the actinic ray, commonly called the ultraviolet light, in the treatment of animal diseases. In the beginning may we explain that these light rays are not a panacea for all diseased conditions, but they are a valuable adjunct in the treatment of many diseases, and for some are sufficient to bring about complete recovery.

The use of ultraviolet radiation for its beneficial effects as a therapeutic agent is very old, having been used by the early Egyptians in the form of sun-baths. Sunlight has always been regarded as a valuable asset in the treatment of disease. In 1866, Sir Isaac Newton made the discovery of the spectrum, revealing the composition of light. He gave the names of violet, indigo, blue, green, yellow, orange, and red to the colors which today are familiar to all of us. At that time he did not know that there were over a hundred different hues present, all of which are invisible to the naked eye. By the aid of present-day apparatus these colors are now visible. Newton did not know that beyond the red edge there is infra-red radiation and that beyond

DIAGRAMMATIC SPECTRUM ANALYSIS
SCALE IN MILLIMICRONS. (mμ)

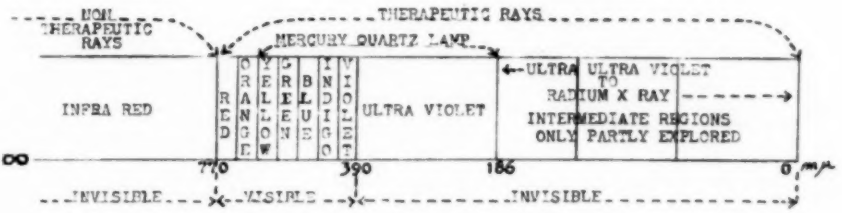

FIG. 1. Diagram of spectrum analysis.

the violet edge there is ultraviolet radiation, which differ from the visible radiation physically only in wave length and frequency of vibration. It is only this difference which distinguishes the violet light of the visible spectrum from the invisible ultraviolet

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radiation. The term millimicron ($M\mu$) is used in measuring wave-lengths. The accompanying diagram (fig. 1) indicates, in a general way, the wave-length limits of the different spectral regions of radiant energy given in the order of increasing wave-lengths.

FIG. 2. Air-cooled mercury quartz lamp now in use at the Kansas State Agricultural College.

The modern mercury quartz lamp is a machine which produces large quantities of ultraviolet radiation. This has the advantage over sunlight of giving a constant source of supply, whenever desirable, for use under the best of conditions. It has the advan-

tage of allowing only the ultraviolet radiation, which are cold rays, to pass through the quartz lamp, and it filters out the infra-red, red, orange, and most of the yellow, also some green and blue, which are the heat-producing rays.

In general there are two types of mercury quartz lamps; the air-cooled, such as the one illustrated in figure 2, and the water-cooled or compression lamp. The water-cooled has the advantage over the air-cooled of permitting deeper therapy. The rays are given off inside of a quartz, water-cooled applicator. This allows compression treatment by producing a local dehematization through the pressure of the quartz lens on the tissue, thus enabling the ultraviolet rays to penetrate into the deeper layers of

FIG. 3. Fourteen-weeks-old cockerels showing undeveloped sexual characteristics, and effects of ultraviolet-light exposure, ten minutes daily for six days.

the epithelial tissues instead of being absorbed by the blood in the surface capillaries. In human medicine specially shaped applicators allow the ultraviolet rays to be concentrated at various points, such as the tonsils, larynx, uterus, and other parts not easily accessible.

The machine now in use in the Veterinary Hospital of Kansas State Agricultural College is known as the U. Vare poultry treater (figure 2). It is the first of its kind ever manufactured and is designed especially for use in poultry houses. It was donated by the Cooper-Hewitt Electric Company, for experimental purposes. There are many other models and other makes of quartz mercury lamps on the market but this has some decided

advantages for an air-cooled lamp. It is easy to operate and the senior and junior students do so daily.

To understand the therapeutics of the ultraviolet or actinic ray, we must not confuse it with the X-ray. Also actinotherapy is not entirely synonymous with sunlight or heliotherapy. When the ultraviolet ray is applied to living tissue it is followed by two reactions, one local the other general. The local is manifested by varying degrees of erythema and the general reaction is manifested by blood-chemistry reactions, the sum total of which may be said to be decidedly beneficial in many morbid conditions. The actinic ray itself does not produce serious burns, though there may be erythema. Actinic rays will not destroy normal tissue, even with one-half hour's exposure. The shorter the ultraviolet ray the less it will penetrate, but the more bacteri-

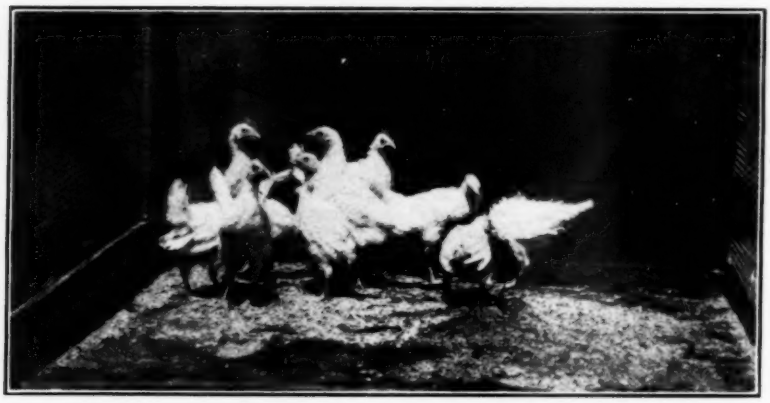

FIG. 4. Ten-weeks-old chicks on ordinary feed and in nutrition room ten weeks. Ultraviolet light for six days a week.

cidal its action. Most of the actinic rays will not pass through glass. They are antigenic, increase the immunizing powers of the body, increase the erythrocytes, and normalize the leucocyte count. Actinic rays allay inflammatory conditions by destroying the bacteria and soothing the nervous structure.

Actinic rays may produce local effects when desired, or systemic effects, even at a distance from the area rayed. The rays are absorbed by the capillary blood-stream and carried to distant parts. Placing the rays on the arm and taking a fog-plate of the leg made certain that part of the blood-stream carries the ray. Infection in wounds yields readily to the ultraviolet ray. However, they should be considered as auxiliary treatment, and the recognized surgical methods of treatment should not be neglected.

The ultraviolet light is used very extensively in human medicine. It gives the most beneficial results at the present time against cancer and tuberculosis.

In research work on animals it has been shown, by Prof. J. S. Hughes (see figure 3), that ultraviolet light does increase egg production, hatchability of eggs produced, as well as prevent and cure outbreaks of weak legs or rickets in chickens.*

Dr. C. Little, of the University of Maine, and Dr. W. Bovie, of Harvard, have found through experimental research that the

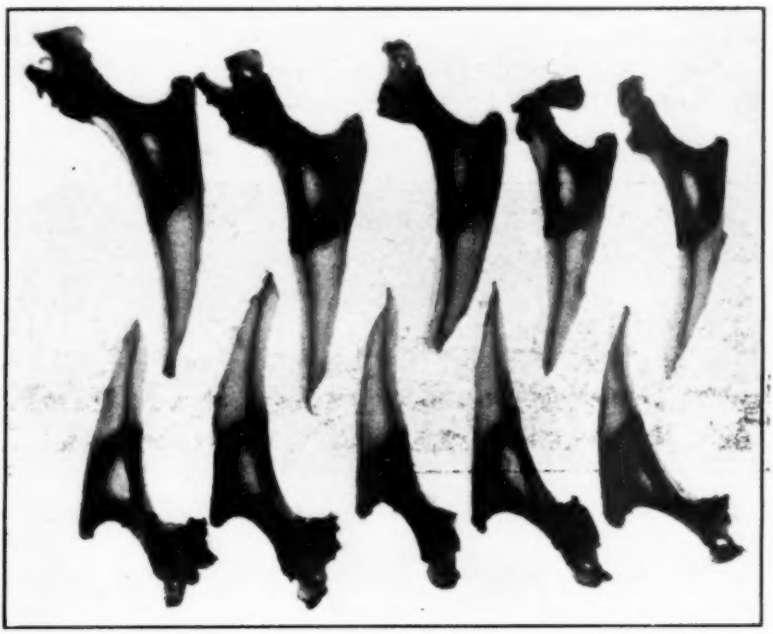

FIG. 5. Breast-bones from chicks shown in figure 4.

proper use of ultraviolet light is a complete substitute for the normal exposure to direct sunlight in the raising of chickens. Figures 4, 5, 6, and 7 show chickens and their removed breast bones. These are ten-weeks-old chicks on ordinary feed, with and without ultraviolet-light exposure, the exposure being for periods of ten minutes a day, six days a week.

Our work has not been extensive as yet, but repeated results on some 40 to 50 cases give us a feeling of justification in offering the following typical case reports on small animals.

*See experiments, Contribution No. 107, Department of Chemistry, No. 27, Department of Poultry Husbandry, Kansas State Agricultural College, vol. lix, no. 1522, p. 231, *Science*.

Case Reports

Case 1: A four-year-old coursing greyhound, Melcum Burr, considered the fastest dog in America, tore a toe loose in a race. The owner bandaged the leg too tightly and, in three days, pressure necrosis and auto-mutilation left all the bones exposed, and two lateral metacarpals missing. The animal was brought to the hospital, the wound washed, the dog anesthetized, and the bones having necrotic surfaces were removed. The wound was given three minutes of ultraviolet-light exposure and bandaged. The bandage was covered with sodium silicate to prevent the animal chewing it. This dog tore off three bandages before the wound was "rayed," and never bothered the bandage after receiving the ultraviolet-light treatment. The treatment was repeated daily, and the wound healed exceedingly rapidly with almost an entire absence of pus formation.

FIG. 6. Ten-weeks-old chicks on ordinary feed and in nutrition room ten weeks. Without exposure to ultraviolet light.

Case 2: A large mongrel bull terrier, with his head and neck edematous and extensive skin lesions of moist purulent exudate on these parts. Diagnosis: acute, moist eczema with complications. Treatment: Clipped the hair over the region of the head, wiped it dry, and applied 20 minutes of ultraviolet radiation. Zinc oxid ointment was applied on one area on the head. In three days the skin was dry and almost normal. In five days the animal was taken home. This rapid recovery was repeated in many other moist eczema cases.

Cases 3 to 10: Of eight typical canine distemper cases five recovered in varying periods of two to four weeks' time after a daily exposure of 20 minutes to the actinic ray. Patients frequently go to sleep during the treatment. Three dogs not given the ultraviolet-ray treatment during this time all died. We had considered the virus mild in all these cases.

In conclusion we feel that the use of ultraviolet radiation has direct beneficial results in the treatment of certain diseased conditions and that it will find its place in the near future in prac-

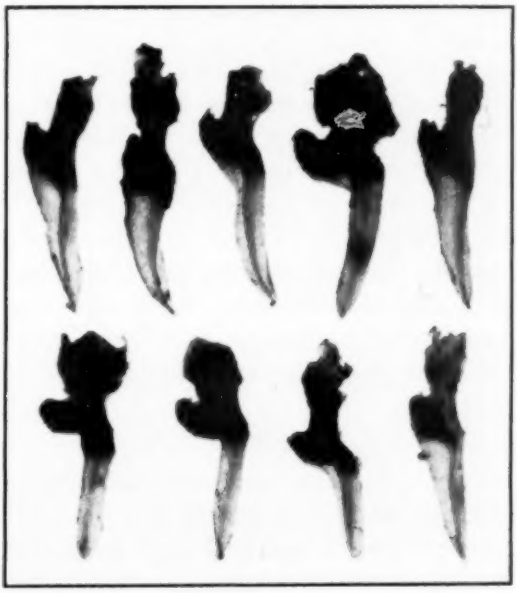

FIG. 7. Breast-bones from chicks shown in figure 6.

tical clinical veterinary therapeutics. This report is preliminary and accurate detailed clinical data are in the process of being compiled.

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See America First via Great Northern

MINERAL MIXTURES INDICATED

The railroads of the United States last year paid to shippers $723,085 for eggs broken in transit. That was $111,465 more than they paid during the previous year.—*Chicago Herald Examiner.*

One conclusion to be drawn from these figures is that the hens are slighting the quality of the outer casings for the sake of productions records. A firmer shell might result if the hens were placed on a part-time ration of cement and iron filings.—*Detroit Free Press.*

COLONIC ANESTHESIA IN DOGS

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During the past two years, while engaged in a study of synergism, it has suited the writer's purpose to test the effect of certain drug combinations by injecting these combinations into dogs prior to the induction of anesthesia by the ether-oil colonic method. These studies, as they pertain to the study of synergism per se, have been reported upon elsewhere[1] and will not be dwelt upon here; the study of colonic anesthesia in dogs necessitated by the conditions of the experiments, however, is thought worthy of a separate report in this place.

The subject was studied under three heads, to be denominated here series A, B and C.

SERIES A

Object: To determine the amount of ether-oil which is always effective in inducing satisfactory anesthesia.

Method: Dogs, ranging in weight from 5 kg. to 23.5 kg., were injected subcutaneously in the side with an aqueous solution of 0.01 gm. morphin sulphate per kilo body weight. After one hour they were tied to a dog-board upon their left side; a No. 29 soft rubber catheter was lubricated and introduced slowly into the rectum and colon for an average distance of 7 inches, and the ether-oil mixture allowed to flow in during four to six minutes. Gwathmey,[2] who developed the method in the human, having suggested 75 per cent ether and 25 per cent olive oil, a mixture in these proportions was used in all cases, with the following results:

(1) One ounce of the mixture per 40 lbs. of dog was ineffective in inducing anesthesia.

(2) One ounce of the mixture per 30 lbs. of dog was little, if any more, effective.

(3) One ounce of the mixture per 20 lbs. of dog was in all cases effective in inducing and maintaining surgical anesthesia.

SERIES B

Object: To determine the amount of morphin sulphate which it is necessary to inject in order to obtain satisfactory anesthesia when the ether-oil is introduced.

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Method: It having been determined in series A that one ounce of the ether-oil mixture per 20 lbs. was always effective in inducing anesthesia when the preliminary dose of morphin had been .01 gm. per kilo body weight, this dose was therefore fractionated and dogs were injected with preliminary doses of morphin ranging from .01 gm. as the highest to .001 gm. as the lowest, with the following results:

(1) On the lower doses there is usually a brief excitement stage which lasts for a short time after the ether-oil is introduced. There is no approach to anesthesia on these lower doses.

(2) As the doses are increased the excitement stage fails to appear and anesthesia begins to be approached. Beyond .0075 gm. per kilo light anesthesia is frequent but sometimes fails to occur.

(3) Whenever .01 gm. of morphin sulphate per kilo body weight is injected, preliminary to the introduction of the ether-oil, anesthesia invariably results.

Series C

Object: To determine the amount of time which should elapse between the injection of the morphin and the introduction of the ether-oil in order to obtain the most satisfactory anesthesia.

Method: Dogs were injected with the effective dose of morphin and then the effective dose of ether-oil was introduced at intervals of time ranging between fifteen minutes and one hour and fifteen minutes, with the following results:

(1) At fifteen minutes attempts to introduce the tube and have it retained nearly always fail because the peristaltic increase induced by the morphin is still very marked.

(2) At thirty minutes it is usually possible to obtain anesthesia which, however, is oftentimes much slower in coming on than it would have been had the interval been longer. Sometimes, also, persitalsis is still sufficiently active to cause the animal to eject a large part of the mixture and thus cause the attempt to fail.

(3) At one hour, anesthesia is always obtained. If, however, the ether-oil mixture is introduced too rapidly the amount of gas evolved may cause the attempt to fail through ejection of the mixture, even after this time interval. From 4 to 6 minutes should be allowed for the introduction of the mixture.

Description of Anesthesia

Morphin sulphate, .01 gm. per kilo body weight, followed in one hour by one ounce of the ether-oil mixture, is always effective in inducing and maintaining surgical anesthesia. Ether is usually detected on the breath before the last of it has been introduced into the colon, anesthesia being complete in an average time of thirteen minutes. To date, in the more than fifty cases, there have been no failures. Sometimes there is some slight loss due to bubbling of gas up through the tube, or around it at the anus; but estimate of the amount lost is made and then that amount added. Complete surgical anesthesia lasts from one to one and a quarter hours; in several cases, at the first signs of returning consciousness, another full dose of the ether-oil mixture (one ounce per 20 lbs.) has been introduced and anesthesia maintained for an additional hour. The usual test for complete anesthesia is the ability to make an abdominal incision through all the layers of the skin in a dog having complete muscular relaxation. However, in order to be doubly sure, in a number of cases (selected at random) the abdomen has been completely laid open and rough manipulative procedures have been performed upon the gut. Muscular relaxation is always complete, though the partial retention of reflexes is always noted; in several cases dogs have responded to a whistle by partially raising the head while major surgery was being done on the abdomen.

Careful observations of the respirations and pulse reveal these functions less disturbed than in inhalation anesthesia. There is a quite remarkable absence of salivation and of any movements of the body in the second (excitement) stage.

A protocol, selected at random from the series, is here given:

Dog B: Male; weight 14 kilos; estimated age, 1 year; condition, good; third anesthetic.

March 3.

12:00 m.	Morphin sulphate subcutaneously, right side, 0.14 gm. (3.5 cc of a 4% solution).
1:08 p.m.	Placed on board, tied down on left side. Resisted pricking of skin of abdomen with knife. Respiration 18, pulse 84.
1:14-1:21	Rectal tube introduced (very little resistance) and 47 cc of ether-oil (ether 3 parts, oil 1 part) introduced (1 oz. per 20 lbs.).
1:26	Dog cannot be aroused but eyes are open. Lid reflex undiminished.
1:30	Respiration 20, pulse 104. Untied and placed on back. Muscular relaxation complete, eyes half closed. Lid reflex present but diminished.
1:35	Incision made down to peritoneum. Anesthesia perfect. Three interrupted sutures, painted with iodin and alcohol. Respiration 24, pulse 116.

1:40 Anesthesia continues. Respiration 24, pulse 120.
1:45 Anesthesia continues. Respiration 24, pulse 120.
1:50 Anesthesia continues. Respiration 26, pulse 116.
2:00 Anesthesia continues. Respiration 28, pulse 122.
2:20 Anesthesia continues. Respiration 28, pulse 120.
Full force of hemostat on belly wall; no response.
2:25 Introduced small catheter beside the other and began washing out.
2:31 Washing out completed, 500 cc tap water. Returning water oily, with slight odor of ether.
2:36 Moving head about and pawing with front legs.
2:52 Rolled himself off the dog-board.
3:02 Dog returned to kennel; moves about on legs groggily, selecting place to lie down; lies down in natural position.
4:00 Sleeping but quite easily aroused.

March 4.
9:00 a.m. Dog completely recovered.

In none of the dogs have there been any symptoms of colitis, or of even the very slightest rectal irritation. One of the dogs fell sick after having been anesthetized (colonic) five times at intervals of one week. Symptoms: malaise, weakness of front legs, temperature 103.2 F. This dog was then given the usual dose of morphin but anesthetized by the inhalation method, 25 cc of ether being required by the open-drop method to establish the surgical stage. The animal was used for routine laboratory work and at the end of two and one-half hours, when killed, a total of 161 cc of ether had been used; the amount required in the colonic method in this length of time would have been 86 cc (115 cc of the mixture). The colon and rectum were carefully examined and no evidence of inflammation whatever could be found therein. This dog had several wounds upon the abdomen and probably died from septicemia; the other organs were not examined.

In the interval of one hour, between the injection of the morphin and of the ether-oil mixture, the dogs are allowed their freedom in a large space. During this time they defecate and urinate several times, but vomit only rarely. They feebly resist catching, and the weakness of the hind legs, typical of morphin, is observed in all cases. When placed upon the anesthetizing table they show no signs of respiratory embarrassment, though the amplitude of the respirations is perhaps slightly less than in the normal and the rate a little slower. In all cases they are able to stand, though somewhat groggily, one-half hour after the ether-oil mixture has been washed out of the colon, and when removed to the kennels at this time they always move about and select their own place for lying down.

Most of these experiments were performed in the afternoon, the animals being returned to the kennels between four and five

o'clock. They were always found to be completely recovered at nine in the morning and remained in a perfectly normal state thereafter.

Discussion

The advantages claimed by Gwathmey[3] for ether-oil colonic anesthesia in the human, and statistically attested by Meyer and Robbins[4] and others, are amply borne out for dogs by these experiments. These advantages can perhaps best be pointed out by making use of Gwathmey's original headings:

"*Safety*"—While the induction of third-stage anesthesia with ether in an average time of thirteen minutes, by placing within the body at one time the entire amount of ether to be used, may appear somewhat dangerously precipitate, it is in fact only apparently so. The rate at which ether separates from ether-oil mixtures *in vitro* was shown by Baskerville,[5] in 1915, to be a definite and fairly fixed one. This definite rate of separation must apply also under the conditions obtaining *in vivo;* for were it possible for all, or a large part, of this ether to become available for absorption into the circulation at any one time, it should be expected that at least some cases of too profound anesthesia, if not actual deaths, would have been encountered in the series. No such cases occurred; but on the other hand, in all instances, a definite quantity of ether per pound body weight produced a satisfactory, but not too deep anesthesia, which lasted for a predictable length of time, after which the animal quickly regained consciousness. This is taken as evidence that only a small portion of the total amount of ether placed in the colon is available to the circulation in a unit of time. The partial retention of reflexes (the lid reflex never entirely disappears) must be taken as further evidence for safety; indeed some of the animals do not seem to lose consciousness, entirely, for in some cases feeble response will be made to a whistle while major surgery is being performed upon the abdomen.

"*Comfort*"—The animal is not subjected to the indignity of being forcibly held while the objectionable cone is placed over the muzzle, nor does he make even the slightest struggle during the second stage.

"*Control*"—When the correct amount of the mixture is administered per pound body weight, the method is absolutely controllable in both directions: the anesthesia may be terminated at any time by washing out the colon with tap water, with a rapid

return of consciousness; the state may be prolonged for any desired length of time by adding, for every additional hour of anesthesia required, one ounce of the mixture per 20 lbs. body weight. If, at any time, the anesthesia seems too light, a cloth may be placed over the muzzle, thus compelling a partial rebreathing of the fumes, with an appreciable deepening of the state.

"*Efficiency*"—Whenever one ounce (30 cc) of the mixture per 20 lbs. is used, perfect anesthesia results. It is to be remembered, however, that the morphin has heightened the superficial reflexes in these animals and that they are excessively sensitive to noise and light. The eyes therefore should be covered and the necessary noises made by the attendants reduced to the minimum, else the onset of anesthesia will be greatly delayed. The actual amount of ether used—22.5 cc (75 per cent of the mixture)—for inducing and maintaining surgical anesthesia is much smaller than required in any other method available to us for safe work in the laboratory.

"*Simplicity*"—The apparatus required is one No. 29 soft rubber catheter, one No. 13 same, a spring or screw clamp for each, two small funnels, a receptacle to catch the oily water when washing out the colon, and a stoppered flask in which to mix the ether and oil just before using. One introduces the large catheter, which has previously been lubricated with petrolatum and filled with the mixture so that it just shows in the attached funnel, for about 7 inches, and then slowly (during 4 to 6 minutes) pours in the measured quantity of the ether-oil, closing the clamp when the fluid just shows again in the funnel. The catheter is allowed to remain in place; the writer has usually tied it to the tail with a bit of string.

At the conclusion of the experiment, the small catheter is introduced beside the larger one, the latter withdrawn somewhat, and the animal is washed out, introducing the water through the small catheter. The articles are always clean and never objectionable to use, an advantage which cannot always be claimed for the foul, saliva-soaked ether cones commonly employed in laboratories. The necessity of maintaining the conditions of these experiments uniform throughout has caused the period of administration of the ether-oil to remain at four to six minutes. It is the belief of the author, however, that the lengthening of this period to ten or even fifteen minutes would entirely eliminate those cases, now occasionally encountered, in which ejection of portions of the mixture necessitates the addition of more of it

in an amount which may be too great or too little to make up the actual deficiency, since the amount lost can only be estimated.

"*After-effects*"—Symptoms of colitis have never been encountered. Recovery has always been prompt and lasting. A measure of analgesia seems to persist for some time, as the animals in this series have seemed startlingly unaware of their wounds several hours after regaining consciousness.

Conclusions

One ounce of a mixture of 75 per cent ether and 25 per cent olive oil per 20 lbs. body weight, introduced into the colon of dogs, one hour after the subcutaneous injection of .01 gm. morphin sulphate per kilo body weight, is effective in inducing safe and very satisfactory surgical anesthesia and in maintaining same for a little more than one hour.

References

[1]Beckman, Harry: Jour. Lab. Clin. Med., x(1924), 3, p. 189. Also subsequent reports now in hands of publishers.
[2]Personal communication.
[3]Gwathmey, James T.: American Yearbook of Anaesthesia and Analgesia (1915).
[4]Meyer, H. W., & Robbins, B. F.: Jour. Amer. Med. Assoc., lxxxiii (20), p. 1581.
[5]Baskerville, Chas.: Proc. Amer. Philosoph. Soc., liv (1915), 218.

BUREAU TRANSFERS

Dr. Emmett J. Kerr, from Des Moines, Iowa., to Chicago, Ill., on meat inspection.

Dr. C. E. Ranney (K. C. V. C. '18), from Chicago, Ill., to Des Moines, Iowa, on tuberculosis eradication.

Dr. A. C. Farmer (O. S. U. '11), from Boston, Mass., to Harrisburg, Pa., on tuberculosis eradication.

Dr. Bertrand J. Eno (O. S. U. '05), from Boston, Mass., to New York, N. Y., on meat inspection.

Dr. B. L. Candill, from Waterloo, Iowa, to Des Moines, Iowa, on tuberculosis eradication.

Dr. David F. Stouffer (K. C. V. C. '06), from Des Moines, Iowa, to Sioux City, Iowa, on meat inspection.

Dr. L. T. Langland (Iowa '22), from Sioux City, Iowa, to Waterloo, Iowa, on meat inspection.

Dr. Warren Sorrell (K. C. V. C. '07), from Salt Lake City, Utah, to San Francisco, Calif., on meat inspection.

Dr. J. S. Clark, from Grenada, Miss., to South St. Joseph, Mo., in charge of virus-serum control.

Dr. L. S. Rohrer, from Kansas City, Kans., to St. St. Joseph, Mo., on virus-serum control.

Dr. D. J. Ryan (K. C. V. C. '11), from Kansas City, Kans., to Chicago, Ill., on meat inspection.

Dr. George A. Posse (Colo. '24), from Chicago, Ill., to Topeka, Kans., on hog cholera control and tuberculosis eradication.

Dr. Roy E. Willie, from Chicago, Ill., to Cleveland, Ohio, on meat inspection.

Dr. Hugh M. O'Rear (Ind. '12), from Indianapolis, Ind., to Nashville, Tenn., in charge of hog cholera control and tuberculosis eradication.

Dr. Edgar D. Wright (Ont. '21), from Milwaukee, Wis., to Indianapolis, Ind., on tuberculosis eradication. Address: 1529½ Ferry St., Lafayette, Ind.

LOSSES AMONG SHEEP IN IDAHO ASSOCIATED WITH THE PRESENCE OF LIVER FLUKES

By W. T. HUFFMAN
Veterinary Inspector, U. S. Bureau of Animal Industry,
and
J. S. DADE
Secretary, Idaho Board of Sheep Commissioners
Boise, Idaho

In several sections of Idaho during the past three years we have had occasion to investigate losses among sheep, that occurred under similar circumstances and undoubtedly had similar causes, in our opinion a complication of liver fluke infection and improper feed.

History: The losses have occurred in valleys ranging in altitude from 5,000 feet to 6,200 feet, among sheep that have been pastured during the early fall on wet, swampy meadows, and on adjacent cultivated fields where swales project. These meadows and swales contain a heavy growth of tufted grass which stands in water from 2 to 4 inches deep all summer until irrigation is discontinued, when the water seeps into the soil. In most cases the losses started during the latter half of October and continued for four to eight weeks or even longer.

In some of the cases the sheep remained on these meadows until December or January, and in others they were removed to higher ground during the latter part of September or the fore part of October, before any losses had occurred, and in a few instances they were removed soon after the losses started. In all cases the sheep were on pasture of some sort until the first of December or later. Most of the bands affected were summered on the mountain ranges and brought to these meadows soon after the first of September, although a few were kept on the meadows or adjacent irrigated ground during the entire season. No difference in percentage of loss was noted between the two classes.

Symptoms: The onset of the disease is sudden, the progress rapid, terminating in death, usually within a few hours after the first symptoms are noticed. Often the animals are found dead on the bed grounds in the morning without having manifested any previous symptoms.

Received for publication, May 20, 1925.

In the cases we have observed the symptoms were listlessness, causing the sheep to lag behind the band, weakness, impaired vision, and twitching of the muscles of the head and neck.

The gait soon becomes staggering and the animal goes down. There is more or less salivation and sero-mucous discharge from the nose. The eyes are red and show some discharge. Breathing becomes short and rapid; the pulse is rapid and very weak. The temperature ranges from 101-104,° the highest mark occurring during the period of struggle and excitement which usually precedes death. Animals of all ages seem to be equally affected.

Postmortem appearances: The rumen usually contains a large amount of badly fermented ingesta, the omasum is dry and hard, while the contents of the abomasum are thin and watery and show some mucus. The entire intestinal tract is generally empty except for bile, mucus, and an excessive amount of gas. There is often some congestion of the serous coat of the fourth stomach and forward portion of the small intestine, but nothing more than a catarrh of the mucous lining. Fringed tapeworms are present in about half the cases. The lymphatic glands are normal; the spleen is normal in size but the parenchyma is usually quite dark and soft; the kidneys show considerable congestion, are dark in color and often quite soft. The bladder usually contains a small quantity of thick, viscid urine. In one case examined icterohematuria was present. The lungs are dark, showing passive congestion, the air passages showing an edematous condition. The liver is nearly normal in size, but has a mottled appearance; the gall-bladder contains a varying amount of bile which usually carries a dark precipitate. The liver substance is friable and easily torn. On the surface will be found one or more areas of inflammation an inch or more in diameter, those near the margin extending through to the opposite side, and by careful dissection the centers of these areas will be found to contain flukes varying in length from one-eighth to one-fourth inch, but very slender. Usually some well-developed flukes will be found in the bile ducts. In one case both *Fasciola hepatica* and *Fasciola magna* were present, but in all others only the former were found.

Discussion

We believe the losses in these cases to be due to two factors. First, the presence of liver fluke disease in the acute stage; and second, auto-intoxication from fermentation of paunch contents, brought on by impaired digestion, as the feed consisted of forage

that was frozen when quite green. In several cases where sheep from swampy ground were mixed with others on higher pastures before any loss had occurred, those that had not been on the low ground sustained no loss, while the others suffered losses of 10 to 15 per cent.

It was noticed that sheep that were taken off the low lands late in September and early in October stopped dying during the latter part of November, while the ones not moved continued dying until January.

Changing the feed from the frozen pasture to hay seems to have some effect, but it seems to take at least two weeks to get much benefit. We have been unable to find any characteristic lesions of hemorrhagic septicemia. The surviving sheep in the bands that are affected seem to winter well and show few, if any, symptoms of fluke infestation in the spring.

Treatment and prevention. Owing to the rapid course of the disease treatment is not considered practical. As to prevention, it has been demonstrated that by keeping sheep off these swampy meadows until all stagnant water has frozen over the losses will be avoided.

Summary and Conclusions

Losses among sheep in several sections of Idaho, pastured during the early fall in mountain valleys, have been under investigation during several years. The onset of the disease is sudden and the animals die usually within a few hours after the first symptoms are noted. Liver flukes in early stages of development have been regularly found to be present in the liver on post-mortem examinations, and usually well developed flukes are found in the bile-ducts (commonly *Fasciola hepatica*, rarely *F. magna*). From the history, symptoms and lesions, the conclusion has been reached that the losses are due to two factors: liver fluke disease and auto-intoxication from fermentation of paunch contents, brought on by impaired digestion resulting from frozen green forage. No practical treatment is apparent but it has been demonstrated that the losses can be prevented by keeping the sheep away from swampy meadows until all stagnant water is frozen over.

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YEAST IN THE TREATMENT OF PELLAGRA AND BLACK TONGUE

A Note on Dosage and Mode of Administration*

By JOSEPH GOLDBERGER, G. A. WHEELER AND W. F. TANNER

Surgeons, United States Public Health Service

In a recent communication[1] there were reported the results of a study of the action of dried brewers' yeast as a therapeutic and preventive agent in pellagra. Evidence was submitted that was interpreted as indicating conclusively that this yeast supplied an essential or the essential preventive factor or factors. Although both therapeutic and preventive tests were made, emphasis was placed on the preventive action, since the preventive test was considered much more significatnt of the value of the preparation.

As was stated in that communication, 26 petients in all were taken under treatment between May 26, 1923, and May 10, 1924. A number of additional cases have been treated since that time. The majority have been mild recurrent attacks. With one exception, all made prompt recoveries from the immediate attack. The exception was a case in a recently admitted patient with symptoms of central neuritis who died within 72 hours after coming under observation and beginning treatment.

Since the publication of the above-mentioned report, inquiries have been received relative to certain details of the treatment with yeast which, so far as possible, we shall attempt to answer at this time.

Our work with yeast has been done almost altogether with a commercial preparation of *dried* brewers' yeast.[2] It is not improbable that pure *dried* bakers' yeast[3] will prove to be approximately equally efficient.

At the outset of the study the therapeutic dose was arbitrarily fixed at 1 gram per kilo of body weight for patients with marked active symptoms. As our experience has grown, we have come increasingly to believe that a considerably smaller dose will suffice, particularly when combined (and so far as possible it should be) with the now well-known dietary treatment. In the cases more recently treated the daily dose has been between 15 and 30 grams (one-half to 1 ounce) or, roughly, 2 level teaspoonfuls three to six times a day.

*Reprinted from Public Health Reports, xl(1925), 19, pp. 927-928.

We were led to test the action of yeast in pellagra by reason of some very favorable indications afforded by tests of this preparation in experimental black tongue in dogs.[4] We would now state that in the treatment of this experimentally induced disease a dose of 15 to 30 grams (one-half to 1 ounce), depending on the weight of the animal, has been found very efficient in cutting short an attack. However, the treatment must be begun relatively early; if delayed until after the dog's temperature has risen to 40° C. (104° F.), the outlook is much less favorable. We would recommend this treatment to veterinarians for trial in the spontaneous disease.

The dry powdered yeast (well dried) keeps well and retains much if not all of its pellagra-preventive and therapeutic activity for some weeks at least. It may be administered in a variety of ways. In pellagra we have, for the most part, given it in ordinary table sirup; less frequently in canned tomato juice, and in milk. In black tongue we have given the yeast in gelatin capsules (veterinary No. 13). It may be stirred into the food as soon as the animal begins to eat.

The beneficial effects of the yeast treatment have repeatedly been recognized by us as early as the end of the second or third day after the treatment was begun in both the human and the canine disease.

In closing this note it may be well to emphasize that in all but the severe cases of pellagra careful feeding is all that is needed. In our judgment, it is only in cases of more than average severity, or where such foods as fresh milk and fresh meat can not be procured, that yeast may serve a valuable purpose and may help to save life.

REFERENCES

[1]Goldberger and Tanner: Pub. Health Rep., 1925, 40, 54-80.
[2]The Harris Laboratories, Tuckahoe, N. Y.
[3]Northwestern Yeast Co., Chicago, Ill., The Fleischman Co., New York N. Y.

THREE NEW DISEASES

Veterinarians will be interested in knowing that the newspapers have discovered three new animal diseases recently. From Shelbyville, Ind., comes a report of "pasillary white diarrahoea in chicks." The second new pathological entity hails from the vicinity of Tipton, Iowa, and has been christened vesicular "stomatoite," in one instance, and "stomatotite" in another. The two latter conditions are said to be quite similar, and were mistaken for foot-and-mouth disease. From Illinois comes word of the third new affection—"nurotic enteritis."

CLINICAL AND CASE REPORTS

(Practitioners and others are invited to contribute to this department reports of unusual and interesting cases which may be helpful to others in the profession.)

TRIPLE INTUSSUSCEPTION IN A PUPPY

By S. E. Hershey, *Charleston, W. Va.*

Police puppy, whelped Nov. 13, 1924, and shipped from a well-known kennel in the East to party at Charleston, W. Va., Jan. 12, 1925, arrived at destination, Jan. 14. The mucous

Fig. 1. Triple intussusception.

membranes of eyes and mouth showed a very anemic condition; bowels purging and with very fetid stools. After arrival of puppy, he was put on liquid diet, with milk, cereals, vegetables, and some little meat and liver once or twice, with a large bone to

gnaw, twice a week. Kept in house most of the time, out only to get house-broken, which it was learning very fast. I could not get the bowels corrected. This puppy was purchased by the head nurse of one of our large hospitals. I was called to see the puppy Feb. 2, and found a very rapid pulse, difficult breathing, very pale mucous membranes, and a well-marked case of pneumonia. There was no soreness over the abdominal region, except that percussion over the stomach would almost suffocate the puppy.

I gave a very unfavorable prognosis, brought the puppy to the hospital, and put it on stimulants at once, with antiphlogistine pack. The puppy died within eight hours. An autopsy was held, and the following was disclosed. Three different intussusceptions were found, 9, 4½, and 3 inches long; several ascarids; mucous membrane of the intestine, the entire length very much inflamed; both lungs badly involved, which I think was a secondary development. The owner said she had not given any physics. What was the cause of the telescoping of the intestine, and could this have been coming on for several weeks or months?

CONGENITAL STENOSIS OF THE DUODENUM

By Oscar Schreck, *New Haven, Conn.*

A female Dalmatian pup was apparently well until six days old, when the pup vomited blood, with some choking, coldness of the body and extremities, and paleness of all the visible mucous membranes. This vomiting was repeated at intervals for six or seven hours. The bowels did not move, as far as known. The pup at this time refused ot suckle the bitch, and the owner, a breeder of dogs, gave the pup milk and port wine, as directed over the telephone by me. There was slight improvement in suckling.

On the seventh day, vomiting again took place, of a large amount of dark-brown or, I may say, chocolate-colored fluid, and quite sticky. Death of the animal occurred on the eighth day.

Autopsy showed the little stomach greatly dilated, the duodenum distended and terminating abruptly just in front of the orifice of the bile duct. Pressure, brought to bear with the finger, could not force the fluid in the stomach beyond this point, nor could the gas present be forced forward from the intestines.

In making my examination, I inserted in the rectum a long thermometer the whole length and, on taking it out, the same was

not soiled with feces, on the sides or on the point, but still the pup strained frequently, as if the bowels were going to move.

In the esophagus, immediately behind the cardiac orifice, was a dark, firm clot in the mucous membrane, about two centimeters in length, firmly attached to the wall. This was in all probability the source of the hematemesis.

ECTOPIC ABDOMINAL VISCERA IN A DOG

By S. E. YOUNG, *Pittsburgh, Pa.*

Subject: Irish setter, female, 1½ years old. Thoroughly broken in the field. Presented for treatment at the hospital, Nov. 21, 1924.

History and symptoms: No history of having had any difficulty in her work or having shown any bad effects from the hunt. Hookworm infestation suspected, although no fecal examination

FIG. 1. Viscera in situ at autopsy.

had ever been made. Had received several heavy treatments, resulting in the patient developing a severe serous diarrhea and emaciation. Admitted to the hospital, Nov. 29, 1924. Pulse, 70; respiration, 32; temperature, 102.2. Fecal examination gave no evidence of any worms, so medication was given to correct digestive derangements from over-drugging.

Results obtained in the course of 20 days, with return of spirits but the appetite poor. Dec. 27, 1924, animal put on a constructive tonic for 10 days, when distemper developed. Given treat-

ment, and made an uneventful recovery about Feb. 1, 1925. All drugs were then discontinued excepting one ounce of cod liver oil daily in the feed.

Rested and fed during February, 1925. Condition in general improving daily, taking on weight, hair-coat much improved with good luster. Bowel action good, regular, and feces normal. No worm eggs found on examination. Temperature average for 30 days, 100.8.

Mar. 4, 10:30 p. m.—Playful, appetite good, defecation and

FIG. 2. Showing ectopic position of liver.

micturition normal, temperature, 101.0.

Mar. 5, 7 a. m.—Apparently normal. 10 a. m.—Found dead.

AUTOPSY

Body placed in the dorsal position on the table and the sternum and abdominal floor removed. On incision into the thorax one-half gallon of a bloody serous fluid escaped. After drainage, the above parts were removed, showing the viscera in situ, as shown in figure 1. Findings:

Skin and subcutaneous tissue: Normal.

Muscular system: Normal.

Heart: Approximately one-third normal size.

Lungs. Left: Posterior lobe, one-half normal size; middle lobe, one-fourth normal; and posterior lobe, normal. *Right:*

Posterior lobe, normal size; middle lobe, one-fourth normal; anterior lobe, normal.

Mediastinum: Normal but lying against the left pleural wall.

Diaphragm: Hernial ring on the right side, ventro-lateral to the esophageal inlet and approximately three and one-half inches by three inches, with an eighth-inch border. Spleen, two thirds of the stomach, omentum, duodenum, pancreas, gall-bladder, and all of the liver, excepting the left antierior lobe and left lateral lobe, in the chest.

FIG. 3. Ectopic viscera removed.

Portal vein: Distinctly divided in T-formation; diameters, respectively; thoracic, three-quarter inch; abdominal, one-half inch.

Bile-duct: From the bladder, in the chest, to the intestines, branching one inch from the intestinal orifice, to the abdominal portion of the liver.

Mesentery: Normal.

Left kidney: Hypertrophied 25 per cent. Texture, normal.

Right kidney: Normal.

Bladder: Empty. Catarrhal cystitis.

Uterus: Normal.

Blood: Uncoagulated, dark, fluid.

Cause of death: Asphyxia.

FEMORAL HERNIA IN A DOG; SPONTANEOUS RECOVERY

By ERNEST F. JARDINE, *Government Veterinary Surgeon, St. Kitts, B. W. I.*

This male, six-month-old, mongrel puppy was brought to me on Feb. 13, 1925, with the history, by the owner, that it had been run over by an automobile three days previously. He is lively, eats, and drinks heartily, but has a swelling on the internal femoral region extending as far as the patella of the right hind leg. The swelling is soft, compressable and reducible, and one can clearly feel the intestines. After removing the hands the enlargement recurs. A diagnosis of hernia is made, and an operation advised, to be done, if possible, on the 15th. In consequence, however, of the rush of work, and long distances that I have to travel, I could not manage to do it on the 15th, as I promised, and I heard nothing more of the case until Feb. 27, when the owner showed me the puppy, entirely cured.

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ABSTRACTS

INVESTIGATIONS OF SIXTY-ONE CASES OF HUMAN ANTHRAX OCCURRING IN NEW YORK CITY DURING THE FIVE YEARS, 1919-1923. W. Jacobsohn. Mo. Bul. Dept. of Health, City of New York, liv (1924), 7.

Sixty-one cases of human anthrax occurred in the city of New York during the five years beginning January 1, 1919. Of these cases, 40 (66%) occurred during the cool seasons of the year, November to April.

Two main sources of infection were noted: (1) Animal hair or articles made from animal hair; (2) animal hides, skins, or articles made from animal hides and skins. Forty-two persons were infected by materials from the first source and sixteen from those from the second source. Included in the first group were thirty-two persons who were infected by shaving brushes. Of the sixty-one cases the anthrax bacillus was found to be present in fifty-four, absent in four and not determined in three cases.

The skin and respiratory tract were the two main portals of infection, the latter being the portal of infection for but one case. The skin of the face and neck was the site of inoculation in fifty-five out of the sixty-one cases of anthrax. Nineteen of the sixty-one cases were fatal, due partly to delay in diagnosis and treatment.

Thirty-six of the cases were treated with anti-anthrax serum only, with a total of twenty-nine recoveries resulting. This treatment, with an average of 100 cc of anti-anthrax serum per day, gave the best results of any treatment used. The serum was injected intravenously, intramuscularly, subcutaneously, and around the lesion; as a rule 40 to 50 cc every 4 hours intravenously and 10 cc once daily, by local infiltration. Later larger initial doses (150 cc)were given.

In recovered cases, the duration of acute illness lasted from seven to thirty days, the average being fourteen days.

S. S.

REPORT ON STUDY OF CHLORIN GAS AS A THERAPEUTIC AGENT IN RESPIRATORY DISEASES. Louis I. Harris. Mo. Bul. Dept. of Health, City of New York, liv (1924), 10.

Following the recommendation of Vedder and Sawyer, that chlorin gas be used as a curative agent in colds, influenza,

whooping cough and other respiratory diseases, in which the infecting organisms are located on the surface of the mucous membranes of the respiratory passages, two clinics were established in the city of New York, for the purpose of investigating these claims.

Following the use of this treatment in 506 cases of various respiratory diseases, both acute and chronic, only 6.5 per cent were found to have been cured and 53 per cent reported improvement, whereas Vedder and Sawyer reported 71.4 per cent of their 931 cases cured.

As a result of these experiments, the authors are constrained by their experience to refuse their endorsement to the use of chlorin gas as a curative for acute and chronic respiratory diseases.

S. S.

A Suggested Method for the Disinfection of Hides and Skins for Anthrax. Henry F. Smyth and E. F. Pike. Mo. Bul., Dept. of Health, New York City, xiii (1923), 6. Reprinted from American Journal of Hygiene, May 1923.

Four methods of disinfection for anthrax are used in the tanning industry at present:

1. A 12-hour soak in a suspension of 15 pounds of burnt lime or of hydrated lime per 100 gallons of water.
2. A 24-hour soak in 1-1000 mercuric chlorid solution.
3. A 24-hour soak in 3% hydrochloric acid in 10% sodium chlorid solution; the so-called Schattenfroh method.
4. A 24-hour soak in 1% formic acid in 1-1000 mercuric chlorid solution; the Seymour-Jones method.

The authors, in an endeavor to overcome some of the objections found in the use of the above methods, devised a method using iodin as the disinfecting agency, which was efficient and produced no injury to the hides. The iodin can be applied in two ways:

1. By vapor disinfection in a "gassing" chamber followed by a short soak in thiosulphate solution, rinsed and placed in the lime pits.
2. (a) Wet disinfection, employing water as a solvent.

(b) Wet disinfection, employing an easily volatile solvent as carbon tetrachlorid or a carbon tetrachlorid-light hydrocarbon (gasoline) mixture.

S. S.

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MELANOSARKOMER HOS KVAEG (Melanosarcomas in Cattle). E. Wiese. Norsk Veterinaer-Tidsskrift, Oslo, ix (1924), pp. 261-264.

A review of the literature dealing with melanomas in cattle is given. Then the author gives a description of two cases of melanosarcomatosis in cattle. In one case the tumor (about the size of a walnut) occurred on the upper lip, in the other on the ear. Both tumors were of the same size. In both cases the cows were of the same breed, "rödkollerace" (Red Polled), but were not related. Both tumors were removed and no signs of recurrence have appeared.

H. J. S.

MELIOIDOSIS: A DISEASE OF RODENTS COMMUNICABLE TO MAN.

Under this title Drs. A. T. Stanton and Wm. Fletcher of the Institute for Medical Research, Federated Malay States, report in *The Lancet* (London) another recently recognized disease transmissible from animals to man.

Melioidosis is caused by *Bacterium whitmori*, named after Dr. Whitmore, who discovered this disease in 1912. They say, "Melioidosis is very like glanders and, as in glanders, its symptoms vary according to the part or organ of the body attacked. There are indeed absolutely no symptoms on which a trustworthy diagnosis can be based and the true nature of the disease can only be determined by the cultivation of the causative organism from the lesions or from the blood, sputum or urine."

Stanton and Fletcher first encountered the disease among their laboratory animals and a domestic cat that was thought to have died from distemper. They summarize the symptoms in man as follows: "Some of the most acute cases resemble cholera or plague; others which have a high temperature from the beginning resemble malaria, enteric fever or general tuberculosis; yet others find their way into the dysentery wards. If pustules and abscesses occur, a diagnosis of acute glanders may be made; while the bone lesions which appear later on resemble tertiary syphilis or chronic tuberculosis. Delirium is a common symptom."

The *B. whitmori* is readily differentiated from *B. mallei* by its motility of young cultures and its curious corrugated growth on glycerin agar.

N. S. M.

Portland—July 21-22-23-24—Plan To Go!

ARMY VETERINARY SERVICE

CHANGES RELATIVE TO VETERINARY OFFICERS

Regular Army

Captain Oness H. Dixon, Jr., V. C., is relieved from duty at Fort D. A. Russell, Wyoming, and will report to Iowa State College, Ames, Iowa, for duty on or about May 15, 1925.

Captain Samuel G. Kielsmeier, V. C., is relieved from duty at Fort McPherson, Ga., and further temporary duty at Camp McClellan, and will report about June 1, 1925, to the Commanding Officer, Fort Bragg, N. C., for duty.

Captain Wm. H. Dean, V. C., is relieved from duty at Jefferson Barracks, Mo., effective on or about July 10, 1925, and will report to the Commanding Officer, Fort Riley, Kansas, for duty.

First Lieutenant Nathan N. Neate, V. C., is relieved from duty at Camp Marfa, Texas, on or about July 10, 1925, and will report to the Commanding Officer, Jefferson Barracks, Mo., for duty.

The following veterinary officers are relieved from duty at their respective stations and will report to the Commandant, Army Veterinary School, Washington, D. C., on or about September 1, 1925, for a course of instruction:

Captain Kenneth E. Buffin, Ft. Meade, S. C.
Captain George J. Rife, Ft. Sam Houston, Texas.
Captain Howard M. Savage, Ft. Snelling, Minnesota.
Captain S. A. Grover, Ft. Bragg, N. C.
Captain Jesse D. Derrick, Presidio of Monterey, Calif.,
Captain P. H. Hudgins, Presidio of San Francisco, Calif.
Captain C. E. Cook, Ft. Hoyle, Md.
First Lieut. James E. Noonan, Ft. Benjamin Harrison, Ind.

Veterinary Reserve Corps

Additional Reserve Officers

Lieutenant Colonel:
Eagle, Richard F. ..... 2137 W. 110th Street, Chicago, Ill.
Major:
Brown, Harry Wilbur ..... Sunbury Road, R. F. D. No. 1, Gahanna, O.
Captains:
Barr, Albert Clyde ..... 3227 Tracy Street, Kansas City, Mo.
Schlegel, John Otto ..... 2411 E. 11th Street, Kansas City, Mo.
White, Wm. Tisdale ..... 14 Edinboro Place, Newtonville, Mass.
Williamson, Wallace LeRoy .. 221 Albany St., Ottumwa, Iowa.
First Lieutenants:
Bissell, Roy C. ..... 1618 S 3rd Ave., Maywood, Ill.
Brady, Ezra M. ..... Tangney Hotel, Spencer, Iowa.
Henninger, Fenton C. ..... Newark, Ill.
Major, John Perry ..... 717 Rutledge St., Spartanburg, S. C.
Norton, Robert S. ..... Velva, N. D.
Weller, Emil E. ..... 502 W. 177th St., New York, N. Y.
Second Lieutenants:
Cummings, Wm. P. ..... 1607 N. 2nd Street, Perry, Ia.
Harkavy, Maurice ..... Aiken, S. C.
Hill, Anson Harris ..... 127 Kansas City St., Rapid City, S. D.
Sisk, B. H. ..... Jefferson Barracks, Mo.
Telford, Roswel A. ..... Parkersburg, Iowa.
Whitehill, N. H. ..... 107 2nd St., N. W., Washington, D. C.

Promotions

Campbell, Walter Earl, Main Street, Bel Air, Maryland, promoted to grade of Captain, Vet-Res.

Kennedy, Rufus Terry, 209 S. Poplar Street, Bucyrus, Ohio, promoted to grade of Captain, Vet-Res.

Denman, Clarence Bukey, R. F. D. No. 2, Newark, Ohio, promoted to grade of 1st Lieut., Vet-Res.

VETERINARY RESERVE OFFICERS AT FORT DES MOINES

Four veterinarians were among the members of the Officers Reserve Corps who reported for duty at Fort Des Moines, Iowa, April 20, 1925. These were: Lieutenant Colonel H. G. Beauman, of Drexel, Missouri; First Lieutenant E. H. Lenheim, of Burlingame, Kansas; First Lieutenant C. H. Kitselman, of Manhattan, Kansas; and Second Lieutenant Charles Dowell, of Center, Missouri. The latter was unable to complete the fifteen-day course, having been called home on account of the serious illness of his son.

Veterinary Reserve Officers, Fort Des Moines, Iowa.
Left to right: Lt. Col. H. G. Beauman, Lt. E. H. Lenheim, Lt. C. H. Kitselman.

For the information and convenience of other officers who may be ordered to duty later in the year, the following suggestions as to what to take along are made by Dr. Kitselman:

A uniform (serge) with the new gold buttons, cap with new gold buttons and long bill, Sam Browne belt, military boots or shoes and puttees, an extra pair of breeches for riding, together with service boots or extra shoes and puttees, campaign hat with chin strap, plenty of underwear, socks, shirts, stocks, soap, towels and toilet accessories, etc. O. D. shirt and cravat can be purchased from the Quartermaster.

COMMUNICATIONS

POULTRY DISEASES CONFUSED

To the Editor:

Your editorial on "Poultry Diseases" in the May issue of your esteemed journal has come to my attention, in which you comment on an alleged statement attributed to me, namely that European fowl pest "has been present in this country for several years, but that only during the past few months has assumed economic importance."

This statement was made with reference to infectious bronchitis, the so-called "Canadian flu," and not with reference to European fowl pest.

I shall appreciate it if you will kindly give this statement equal publicity to that which your May editorial received.

Hubert Bunyea.

Washington, D. C., June 6, 1925.

(The particular clipping from which the statement of Dr. Bunyea was taken contained no reference to "Canadian flu." The introductory paragraph stated: "Illinois poultry raisers have no reason for apprehension that the European 'flu' which has caused consternation in New York and other marketing points will invade and decimate their flocks." In fairness to Dr. Bunyea we will say that the clipping did not mention "European fowl pest" specifically, although, at the time, it was pretty generally believed that the newspaper article quoted concerned the latter disease. Editor.)

LIKED OUR POULTRY NUMBER

To the Editor:

Enclosed find check for $4.00 as subscription to the Journal. The May issue was the best I have read. Do it some more. Issues of this kind are worth a great deal.

G. Van Duzee.

Lamberton, Minn., June 4, 1925.

APPROVED THE ROAST

To the Editor:

Your well written editorial "Prescribers or Peddlers" did not go unnoticed. I am glad you roasted the mineral rot propaganda.

F. G. Steinbach.

Wildwood Crest, N. J., June 5, 1925.

COMMENCEMENTS

ALABAMA POLYTECHNIC INSTITUTE

Commencement exercises at the Alabama Polytechnic Institute were held on May 19. In the College of Veterinary Medicine degrees were conferred upon five members of the graduating class, as follows:

S. O. Benson
B. W. Creel
H. E. Galbreath.
P. D. Nicaise
C. C. Rayfield

KANSAS STATE AGRICULTURAL COLLEGE

The sixty-second annual commencement exercises of the Kansas State Agricultural College were held at Manhattan, May 28, 1925. In the Division of Veterinary Medicine, the degree of Doctor of Veterinary Medicine was conferred upon the following:

Gulabsing Amarsing Ajwani
Fred Russell Allerton
Lamar Perkins Caraway
Harold Lincoln Church
Gerald Roderick Dowd
Joseph Emerson Greer
Verne Clifford Hill
Floyd Edgar Hull
Arthur O'Toole
Armer Porter
Arthur Howard Riley
James Fred Savage

Prizes won by the veterinary students during the 1924-25 scholastic year were awarded on May 15, in the college auditorium, on so-called "Recognition Day."

A cash prize of $30.00, to the student making the highest average grade for general proficiency in all veterinary courses during four years of attendance:

Floyd Edgar Hull, of Dows, Kans.

A cash prize of $15.00, to the student making the highest average grade for proficiency in general pathology:

Amer Porter, of Fredonia, Kans.

A cash prize of $15.00, to the student making the highest grade for proficiency in surgery:

Harold Lincoln Church, of Lincoln, Nebr.

A cash prize of $15.00, to the student making the best grade for proficiency in veterinary clinics:

Elmer William Young, of East St. Louis, Ill.

The money for these prizes was made available through the generosity of two alumni of the Kansas State Agricultural

College, Dr. A. T. Kinsley, of Kansas City, Mo., class of '99, and Dr. E. A. Schmoker, of Monroe, Wash., class of '17. The veterinary faculty of the College contributed one-third of the total.

These prizes serve as a distinct stimulus to the students and the faculty of the Division of Veterinary Medicine feels grateful to those who made them possible.

TEXAS A. & M. COLLEGE

At the commencement exercises of the Texas Agricultural and Mechanical College, held on June 2, 1925, the degree of Doctor of Veterinary Medicine was conferred upon the following graduates:

C. Canion
W. R. McCullough
R. L. Rogers, Jr.
M. Smotherman
C. L. Winchester

UNIVERSITY OF PENNSYLVANIA

One of the features, of greatest interest to veterinarians, at the commencement exercises of the University of Pennsylvania on June 17, was the conferring of the honorary degree of Doctor of Science upon Dr. John R. Mohler, Chief of the United States Bureau of Animal Industry. Dr. Mohler is an alumnus of the University, having graduated from the Veterinary School with the class of 1896. The honorary degree was conferred upon him in recognition of his extensive and valuable research in animal pathology, and of his ability as an administrator.

The degree of Doctor of Veterinary Medicine was conferred upon the following students who had completed the full course of Veterinary Medicine:

James Joseph Cunningham
Harvey Lewis Fell
Gerald Payne Fincke
Charles Edward Flaxman
Daniel Wolf Gates
James Roser Kinney
Daniel Dietrich Kohler
Benjamin Rau
Murrell Orton Robinson
George Fink Sebastian

James J. Cunningham was awarded the J. B. Lippincott Prize of $100 for the highest average for the four years' course, and also the T. E. Munce Prize of $25 for the highest average in the courses in Animal Industry.

The Jeannette Blair Prize of $50 for the best work in the Small Animal Clinic was awarded to Benajmin Rau.

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ASSOCIATION MEETINGS

BAY COUNTIES VETERINARY MEDICAL ASSOCIATION

The regular monthly meeting of the Bay Counties Veterinary Medical Association was held April 14, 1925, at the Whitcomb Hotel, San Francisco, with Dr. Nelson E. Clemens presiding.

At 7:30, thirty-eight members and visitors sat down to a five-course dinner. This occasion was in the nature of a farewell surprise to Dr. Jacob Traum, who is soon leaving for Washington, and thence to Europe, as a member of the committee selected to carry on investigations with foot-and-mouth disease. This committee is composed of three members: Dr. P. K. Olitzsky, of the Rockefeller Institute for Medical Research; Dr. Harry W. Schoening, of the Pathological Division, Bureau of Animal Industry, U. S. Department of Agriculture; and Dr. Jacob Traum, of the University of California. This committee will conduct its investigations with a fund of $75,000 appropriated by the 68th Congress, and included in the Second Deficiency Act.

Immediately following the dinner, President Clemens called on the secretary to explain to Dr. Traum the nature of the meeting. Dr. Traum had been brought to the hotel on a pretense that this was to be a luncheon affair, prior to the regular meeting.

Dr. George H. Hart then spoke at some length, explaining the nature of Dr. Traum's appointment, and what it meant to the University, to our Association, and to every member of the veterinary profession. He concluded his remarks by calling attention to the fact that the members of the Association would have no cause to forget Dr. Traum during his absence, but that the members of the Association desired to present Dr. Traum with some suitable remembrance which would help him to keep in mind the memories of his associates and of the Association. On behalf of those present Dr. Hart then presented Dr. Traum with a beautiful gold watch, suitably engraved. Before Dr. Traum could get to his feet, Dr. J. J. Hogarty took the floor and, with fitting remarks, presented Dr. Traum with a fountain pen, as a personal gift and tribute. Dr. Traum received these gifts in the same spirit as that in which they were given, and replied to the praises of goodfellowship very feelingly.

Under the regular order of business the minutes of the previous meeting were read and approved. The applications for member-

ship of Dr. Earl M. Dodds and Dr. H. B. Wintringham were received and accepted.

The secretary announced that Dr. H. E. Torgensen had extended an invitation for the Association to hold the June meeting in San Francisco, in the Directors' Room of the National Ice Cream Company.

Drs. Longley and Hart reported upon legislation of interest to the veterinarians. Dr. Archibald R. Ward, of Detroit, Mich., was among the visitors present. He reminisced at length and related some very interesting experiences in his travels.

Dr. J. P. Iverson, Chief of the State Division of Animal Industry, was a late visitor, arriving near the end of the meeting. Dr. Iverson stated that he had traveled from Yosemite Valley to be present at Dr. Traum's dinner. On behalf of the State Department of Agriculture, Dr. Iverson thanked Dr. Traum for his good work and hearty cooperation during the foot-and-mouth epizootic, and extended best wishes for Dr. Traum's success in his new work. Dr. Iverson reported on the Veterinary Practitioner's Act and its chance of passing at this session of the California legislature.

Dr. Traum was showered with felicitations following adjournment, and it is a matter of record that this was the best attended regular meeting in the history of the Bay Counties Association.

CLIFF D. CARPENTER, *Secretary.*

ILLINOIS VALLEY VETERINARY ASSOCIATION

Veterinarians located in LaSalle and Grundy counties met at Morris, Ill., April 13, 1925, and organized the Illinois Valley Veterinary Association. The organization started off with fourteen members. Officers were elected as follows: President, Dr. C. J. Gillen, of Ottawa; vice-president, Dr. G. D. Grogan, of Mendota; secretary-treasurer, Dr. D. M. Palmer, of Ottawa.

FOX VALLEY VETERINARY ASSOCIATION

The Fox Valley (Ill.) Veterinary Association was organized at Aurora, Ill., April 18, 1925. Veterinarians from Kane, DeKalb, DuPage and Kendall counties formed the new association. Officers were elected as follows: President, Dr. F. W. Caldwell, of Wheaton; vice-president, Dr. Crawford, of Hinckley; secretary-treasurer, Dr. Hahn, of Geneva.

NORTHWESTERN ILLINOIS AND SOUTHWESTERN WISCONSIN VETERINARY MEDICAL ASSOCIATION

The Northwestern Illinois and Southwestern Wisconsin Veterinary Medical Association met at Freeport, Illinois, April 16, 1925. Dr. F. D. Yeager, of Lena, presided. About thirty members were in attendance.

Dr. J. S. Koen, of Bloomington, addressed the meeting on matters pertaining to the general welfare of the profession. He offered suggestions for better cooperation between county veterinarians, practitioners and live stock owners. He cited the deplorable conditions existing in Russia following the break-down of veterinary service there, when the Bolshevists gained control.

Dr. Roy E. Kluck, of Forreston, president of the Illinois State Veterinary Medical Association, spoke on the work of the state organization and plans for coming meetings. Dr. B. L. Lake, of Sterling, and Dr. Glenn D. Grogan, of Mendota, also addressed the meeting.

The next meeting will be held in October.

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SOUTHWESTERN MICHIGAN VETERINARY MEDICAL ASSOCIATION

The spring meeting of the Southwestern Michigan Veterinary Medical Association was held at the hospital of Dr. O. G. Davidson, Kalamazoo, Michigan, April 24, 1925. The visiting veterinarians had an opportunity to inspect one of the most up-to-date small animal hospitals in Michigan, and Dr. Davidson was the recipient of many compliments for his enterprise.

The program was opened by having a round-table discussion of several very interesting case reports by the practitioners present.

"Advertising the Veterinary Profession" was the subject of an address by Dr. Ward Giltner, of East Lansing, who gave his ideas on the form which advertising by veterinarians should take. It was the opinion of Dr. Giltner that veterinarians frequently pass up splendid opportunities for giving the profession favorable publicity, and he cautioned the members against yielding to any demand for advertising not in keeping with the best traditions of the profession.

Dean Giltner was followed by Dr. H. Preston Hoskins, Secre-

tary-Editor of the A. V. M. A., who related his observations upon and studies of different forms of publicity and advertising. He differentiated between the two, and defined publicity as what is needed, and should be fostered by the profession as a whole, whereas advertising is the uncontrolled effort of the individual to display his wares before the public. Dr. Hoskins gave specific illustrations of advertising and publicity, at the same time quoting the section of the code of ethics of the A. V. M. A. relative to advertising.

Professor B. B. Rosebloom, of the Michigan Agricultural College, addressed the meeting on "Endocrinology," giving examples of the use of knowledge on this important subject, in veterinary practice.

Dr. B. J. Killham, state veterinarian, spoke on legislative and other activities at Lansing. He enumerated the various bills in which veterinarians were interested and gave the status of each.

The meeting ended with a dinner and smoker at the Columbia Hotel.

Portland—July 21-22-23-24—Plan To Go!

MASSACHUSETTS VETERINARY ASSOCIATION

The annual meeting of the Massachusetts Veterinary Association was held at the Twentieth Century Club, Boston, Mass., April 29, 1925. Dinner was served at 6:30 and about forty-eight members were present. Following the dinner, an address was given by the retiring president, Dr. John B. Lentz.

After reviewing the activities of the Association during the past year, Dr. Lentz took up the early history of the veterinary profession in Massachusetts. He lead up to the number of graduate veterinarians who had settled in the State during the past fifteen years, and showed this to be an average of two per year. He compared these figures with the rate of four per year, during 1919 and 1920, for the entire United States.

The next speaker of the evening was Dr. L. H. Howard, who spoke on the advances made by the veterinary profession in the State, and pointed out the significance of the School of Avian Pathology as a decided step forward.

Dr. E. A. Crossman spoke on the tuberculosis eradication work, and gave some interesting figures relative to the number of

accredited herds in the entire country, and the rate at which accreditation was going ahead in the New England states. He pointed out that it would be an impossibility for state or federal authorities to carry on or keep up this work, without the cooperation of practicing veterinarians. He also pointed out the great benefit which must come to the practitioner in the near future, as a result of this foundation work.

Dr. Langdon Frothingham, in a very pleasing manner, described conditions of the veterinary profession in Massachusetts years ago, and complimented the profession and the Association on the marked progress which they are making.

The next speaker was Lt. Col. Uri, Army Base, Boston. Col. Uri spoke on behalf of the Reserve Corps, and described to the members present the desirability of veterinarians becoming affiliated with this Corps.

In his usual pleasing manner, Dr. Thomas E. Maloney spoke on matters relating to the advancement of the veterinary profession. He pointed out that in view of the fact that the Massachusetts Veterinary Association was a very much larger organization than formerly, it should accordingly be much more influential in advancing the profession. He emphasized the necessity of cooperation, publicity and active interest of all members.

Other speakers of the evening were Drs. Benjamin D. Pierce, Wm. H. Dodge, William M. Simpson, Hugh F. Dailey, Gordon N. Huse, N. J. Pyle and J. W. Patton. The optimistic spirit which prevailed was an inspiration to all those present.

A short business session was held at which the following business was transacted. Application for membership was made by Dr. E. H. Heath, Bradford, Mass., and resolutions were presented on the death of Dr. Austin Peters, by Dr. L. H. Howard. Embodied in these resolutions was a brief sketch of Dr. Peters' career, and the part he played in building up the profession in Massachusetts. The Secretary-Treasurer's report was presented in the form of a typed synopsis.

Election of officers for the year 1925-26 resulted as follows: President, Dr. J. J. Mulvehill, Norwood; first vice-president, Dr. E. A. Crossman, Boston; second vice-president, Dr. E. A. Devarennes, Quincy; secretary-treasurer, Dr. H. W. Jakeman, Boston.

May Meeting

The May meeting of the Massachusetts Veterinary Association was held at the Department of Veterinary Science, Massachusetts

Agricultural College, Amherst, May 13, 1925. This meeting was held in conjunction with the two-day veterinary conference on diseases of poultry which was held at the institution. The program included the following lectures and demonstrations:

WEDNESDAY, May 13

"Clinical and Postmortem Diagnosis, Prevention, Significance and Distribution of So-called European Fowl Plague," by Dr. E. L. Brunett, New York State Veterinary College, Cornell University.

"Some Important Animal Parasites Infecting Poultry, Their Identification, Diagnosis, and Treatment," by Dr. E. E. Tyzzer, Department of Comparative Pathology, Harvard Medical School.

"Clinical Symptoms, Postmortem Lesions, and Diagnosis of Poultry Diseases Similar to European Fowl Plague, as Found in the Recent Outbreak in Pennsylvania," by Dr. E. L. Stubbs, Pennsylvania Bureau of Animal Industry.

"Study of Poultry Diseases, Their Pathology, Diagnosis, and Therapeusis in Veterinary Medical Education," by Dr. Veranus A. Moore, New York State Veterinary College, Cornell University.

"The Purpose of an Extension School in Avian Pathology for Practitioners of Veterinary Medicine," by Dr. S. B. Haskell, Massachusetts Agricultural Experiment Station.

THURSDAY, MAY 14

"Description of Cases of Chicken Cholera, Chicken Pox and Constitutional Diseases," (clinical demonstration) by Dr. E. L. Brunett, New York State Veterinary College, Cornell University.

"Postmortem Diagnosis of Avian Tuberculosis and Other Common Diseases Producing Nodular Lesions," by Dr. E. L. Stubbs, Pennsylvania Bureau of Animal Industry.

"Therapeutics, Disinfectants, and Antiseptics Used in Poultry Practice, How Manufactured, Standardized, and Used," by Dr. F. R. Beaudette, New Jersey Agricultural Experiment Station.

"Clinical and Postmortem Diagnosis of the Common Intestinal Diseases of Poultry," by Dr. C. C. Palmer, University of Delaware.

"Therapeutics. Drugs and Chemicals and Their Use in Poultry Practice," by Dr. F. R. Beaudette, New Jersey Agricultural Experiment Station.

"The Problem of Poultry Disease Diagnosis and How It Is Being Met in Other States than Massachusetts," by Dr. George E. Corwin, Deputy Commissioner on Domestic Animals, Hartford, Conn., and Dr. R. W. Smith, State Veterinarian, Laconia, N. H.

On motion it was decided that the regular June meeting of the Association be held in Providence, during the Conference on Tuberculosis Eradication.

H. W. JAKEMAN, *Secretary.*

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WABASH VALLEY VETERINARY ASSOCIATION

The Wabash Valley Veterinary Association met in the Public Library, Marion, Indiana, April 30, 1925. Dr. R. C. Julien, state veterinarian, was the principal speaker. He told how European fowl pest had been eradicated from the seven counties in Indiana,

where it had obtained a foot-hold. Fifty veterinarians cooperated in the work.

Dr. G. L. Simons, of Marion, explained the recently enacted law providing that all milk sold in Indiana must be from tuberculin-tested cows.

The visiting veterinarians and their wives were entertained at the home of Dr. and Mrs. W. B. Wallace, where dinner was served at 6 o'clock. Officers of this live organization are: President, Dr. H. A. Sailors, of Wabash; secretary, Dr. D. D. Baker, of Wabash.

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MICHIGAN-OHIO VETERINARY ASSOCIATION

The annual meeting of the Michigan-Ohio Veterinary Association was held at Adrian, Michigan, May 7, 1925. The program opened with an equine clinic, at the hospital of Dr. Geo. D. Gibson, in charge of Dr. J. R. Forsyth, of Blissfield.

Dr. H. Preston Hoskins, Secretary-Editor of the A. V. M. A., spoke on "Matters of Current Interest to Practitioners." The first subject mentioned was group liability insurance for veterinarians. Dr. Hoskins stated that with the tremendous annual increase in the number of lawyers, all naturally desirous of building up practices for themselves; with the various state legislatures continuing to grind out laws adding to our responsibilities; with juries handing down verdicts which, in some cases, have been enormous, with the consequent newspaper publicity; all these factors have combined to cause the public to sue for damages on the slightest pretext or provocation.

Physicians, dentists and pharmacists, for some time, have carried insurance to protect them from the annoyances and embarrassments of suits for damages, just or unjust. Veterinarians are now coming to wonder whether they should not seek similar protection. For the purpose of getting an expression of opinion, as well as first-hand information, Dr. Hoskins explained that the matter was being presented in this way. When asked whether any member of the Association had been sued for damages, not a single veterinarian, among the thirty present, acknowledged that he had. This is rather unusual, considering that some men present had been in active practice for more than thirty years. The opinion was expressed that the estimated premium of $20.00 per year, for a $1000 policy, was too high, considering

the infrequency with which veterinarians were called upon to protect themselves against lawsuits.

Dr. B. J. Killham, state veterinarian, was the next speaker, and took up some of the points raised by Dr. Hoskins. He related specific instances in which veterinarians had laid themselves open to suits for damages, and made a number of suggestions that, if followed, would be helpful in protecting practitioners from such embarrassment.

Following these two speakers, the members engaged in a round-table discussion of liability insurance and pitfalls to be avoided in practice, all of which was very helpful to those present.

An election of officers resulted as follows: President, Dr. G. H. Gerlach, Morenci; vice-president, C. E. Moorman, Tecumseh; secretary-treasurer, Dr. Walter H. Rozine, Morenci. It was decided to hold the fall meeting in Morenci.

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CONESTOGA VETERINARY CLUB

The annual shad supper and regular monthly meeting of the Conestoga Veterinary Club was held at the Union Stock Yards Hotel, Lancaster, Pa., May 21, 1925.

The meeting opened at 5 p. m., with a very interesting lecture, by Dr. George A. Dick, on "The Principles of Breeding." This lecture was the final one of a course prepared and conducted by the University of Pennsylvania Veterinary Extension School.

Supper followed the regular meeting, with more than fifty members and guests present. Dr. Joseph Johnson acted as toastmaster and introduced Hon. Frank C. Musser, mayor of Lancaster, Pa. Mayor Musser extended a hearty welcome to all present, and then pointed out the important role that veterinarians play in community health work, and incidentally paid the profession a number of compliments.

Among the other speakers were Dr. T. E. Munce, state veterinarian and chief of the Pennsylvania B. A. I., who spoke on "The Activities of the Pennsylvania B. A. I." Dr. H. R. Church, deputy chief of the Bureau, urged the guests and members to encourage horse breeding. Dr. S. E. Bruner, in charge of tuberculosis eradication in Pennsylvania, talked on "The Progress of Tuberculosis Eradication in Pennsylvania." Dr. C. J. Marshall, of the University of Pennsylvania, recalled some of his interesting

experiences as state veterinarian. Dr. E. L. Stubbs, of the University of Pennsylvania, favored us with a few remarks on "Fowl Pest." Brief talks were made by Hon. E. P. Brown, member of the State Legislature from Susquehanna County; Mr. F. S. Bucher, extension representative of the Lancaster County Agricultural Association; and Mr. E. A. Seamon, of the State Bureau of Markets.

The supper was enjoyed by all present, with expressions of satisfaction and the desire to be present at the next one.

HENRY S. WEBER, *Secretary.*

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McLEAN COUNTY VETERINARY ASSOCIATION

The "spring meeting extraordinary" of the McLean County Veterinary Association was held at Bloomington, Ill., in the rooms of the Association of Commerce, May 27, 1925.

Dr. Frederick R. Whipple, of Peoria, opened the program with an address on "Small Animal Practice." Dr. Whipple limits his practice to small animals and was well qualified to speak on the subject. He was followed by Drs. A. E. Campbell, of Rintoul, and C. W. McLaughlin, of Melvin, who discussed phases of Dr. Whipple's remarks.

Dr. A. T. Peters, of Peoria, discussed "Nutritional Deficiencies, Their Cause and Treatment." Dr. J. S. Koen, of Bloomington, announced plans for the summer meeting of the Illinois State Association.

Dinner was served at the Y. M. C. A. at 6 o'clock. Hon. Carl Vrooman, of Bloomington, formerly Assistant Secretary of Agriculture, delivered the address of the evening.

J. S. KOEN, *Secretary.*

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CENTRAL MICHIGAN VETERINARY MEDICAL SOCIETY

The program of the spring meeting of the Central Michigan Veterinary Medical Society, held at Jackson, May 28, 1925, was up to the usual high standard of meetings arranged by the energetic secretary, Dr. W. N. Armstrong, of Concord. This meeting

was intended to be a practitioners' affair and such it proved to be.

The subject of "Mineral Mixtures" was introduced by Dr. L. A. Wileden, of Mason. A very spirited discussion followed, with honors about even. Several veterinarians defended the practice of engaging in the sale of mineral mixtures or mineral "feeds," largely on the grounds of self-defense. Others were just as strong in their opposition to this practice and related numerous very unsatisfactory experiences with firms selling such materials. Dr. A. McKercher, of Lansing, was very emphatic in the statement of his belief that it lowered the standard of the veterinary profession whenever a member tried to mix a business of this kind with the practice of his profession.

Dr. F. E. Stiles, of Battle Creek, gave a very instructive talk on "Digestive Disturbances in the Cow." Dr. Stiles related his experiences in the treatment of engorgment of the rumen from green corn, having been called upon to treat a very large number of cases of this kind. He is a strong exponent of the use of aromatic spirits of ammonia in this condition. He advises the use of ounce doses, administered at hourly intervals, in one pint of water by drench, followed with mineral oil. Dr. Stiles also related some interesting experiences with foreign-body pneumonia.

Strangulation of the bowel in the cow was the next condition described by Dr. Stiles. He believes the symptoms are very characteristic. Cows may live, with this condition, for ten to fifteen days, during which time absolutely no action whatever is obtained from any cathartics used. A wiry pulse is characteristic, as well as the discharge of tarry mucus from the lower bowel.

In the discussion of Dr. Stiles' address, Dr. A. C. Curtiss, of Hillsdale, advised the early employment of the stethoscope for the diagnosis of traumatic pericarditis. Dr. Curtiss said that in his experience practically all of these cases would show an increase in the pulse rate, following slight exercise, from 60-70 to 120-130.

Dr. E. J. McLaughlin described Jackson's new abattoir and invited the visiting veterinarians to inspect it. It is quite likely that the building and equipment of this up-to-date establishment is the first step toward the inauguration of municipal meat inspection for the city of Jackson.

Dr. Lynn C. Palmer, of Brooklyn, gave a very interesting talk on "The Care of Bitches During Pregnancy." He spoke of one of the most discouraging conditions confronting breeders, viz:

acid milk. This condition frequently develops about three days after whelping, particularly in bitches that have not had sufficient exercise during pregnancy. Dr. Palmer has been able practically to eliminate the trouble by giving one teaspoonful of milk of magnesia, in the feed, each day for ten days prior and up to date of welping. He also described the precautions that should be taken to prevent puppies from becoming infested with intestinal parasites, the main feature of these precautions being the thorough disinfection of the udders of the bitches before whelping, thereby destroying worm eggs adhering to these parts. Dr. Palmer also described a form of eczema which he believed to be of parasitic origin, possibly caused by a variety of lice. He has been able to control this condition satisfactorily by the use of Cooper's arsenical dip.

Dr. Martin Olthous, of Jackson, related some of his experiences with so-called "fright disease" and described several interesting cesarean operations. Dr. A. C. Curtiss, of Hillsdale, gave some of his observations on the relation of avian, porcine and bovine tuberculosis in Hillsdale County.

The meeting ended with a banquet which came to a close with the usual after-dinner addresses, Dr. B. J. Killham acting as toastmaster. Secretary Armstrong was the recipient of much well-earned praise for the unqualified success of the meeting.

THE A. V. M. A. SPECIAL

Members planning to go to Portland via the "A. V. M. A. Special" should secure Pullman reservations through Mr. J. R. Van Dyke, General Agent, Burlington Railroad, 175 W. Jackson Blvd., Chicago, Ill. Those who plan to take advantage of the opportunity for a stop-over in the Twin Cities, Saturday morning, will have to leave Chicago Friday evening, July 17, at 6:30 p. m. Those who do not plan to stop over will not be obliged to leave Chicago until 11 p. m. that evening, on the Oriental Limited.

In writing Mr. Van Dyke, advise on which train Pullman reservations are desired out of Chicago, also what space—lower berth, upper berth, section, compartment or drawing room—for the journey to Portland. The departing time from the Twin Cities will be the same for everybody—those who plan to stop over in St. Paul and Minneapolis as well as those who plan to go straight through. The Oriental Limited will leave St. Paul at 11:25 a. m., and Minneapolis at 12:01 p. m., Saturday, July 18. Regardless of where you intend to join the party on the official train, make your reservations through Mr. Van Dyke.

NECROLOGY

ALEXANDER PLUMMER

Alexander Plummer, veterinarian, U. S. Army, retired, died at Palo Alto, California, on May 8, 1925, and was buried in the National Cemetery at the Presidio of San Francisco with full military honors on May 12. His old friend and early associate at the old Mounted Service School, Colonel Walter C. Short, made all the arrangements and was in full charge of the funeral.

Dr. Plummer was born in the province of Ontario, Canada, June 26, 1865, and at an early age moved with his parents to Wisconsin, where he was educated in the public schools. He was graduated from the Chicago Veterinary College in 1888 and, after spending a number of years in private practice in his home state, entered the Army on October 20, 1892, and was assigned to duty with the Fourth Cavalry, at Fort Walla Walla, Washington. He accompanied his regiment in its campaign during the Filipino Insurrection and, returning to the United States in 1902, took station at Fort Riley, Kansas, at which place the Mounted Service School was opened in 1903. When his regiment was relieved from duty at Fort Riley, he was retained as instructor in hippology and remained on detached service at the school until 1913 when he was relieved and sent to the Mexican border. Under this service his health broke and he was retired from active service on July 13, 1914. Since his retirement he has made his home in Chico, California, and was able to get around and enjoy life until six months ago when he was suddenly stricken with a severe relapse of his ailment and was taken for treatment to Palo Alto, where he died.

He was possessed of a most genial personality and had a host of friends among the old Army personnel. It was due in a measure to his loyal sense of duty and untiring efforts that the Mounted Service School progressed as it did during its early history. He was one of the pioneers in the uplift of the veterinary profession in the Army, always laboring for a higher plane, and did a splendid service in the long fight for recognition. For the greater part of the time while instructor at Fort Riley he was the veterinary member of the examining board which passed upon entrants into the veterinary military service.

Dr. Plummer joined the A. V. M. A. in 1890 and kept up his affiliation until his death. He leaves a wife, Mrs. Adelaide Bell Plummer, and a host of friends, both civil and military, to mourn his loss.

C. H. J.

GEORGE M. PAXTON

The death on May 23, 1925, at Little Rock, Arkansas, of Dr. George M. Paxton, veterinary inspector of the Bureau of Animal Industry, came as a shock to his many friends and associates. He was taken ill on the night of May 21 and was removed to the hospital where he died from peritonitis, following an operation.

Dr. Paxton was born in Columbus City, Iowa, April 23, 1885, and was unmarried. He was graduated from the Kansas City Veterinary College in 1917, and entered Bureau service as veterinarian in July of that year. Previous to graduation he had been employed as agent in tick eradication work. From August, 1917, to December, 1918, he served as first lieutenant in the Air Service of the United States Army.

Dr. Paxton's service in the Bureau was spent almost entirely in tick eradication, having been assigned in Arkansas, Florida, Texas, and Louisiana. He was inspector-in-charge of that project in the latter state from September, 1921, to February, 1925, when he was assigned as traveling inspector in the same line of activities.

In the discharge of his official duties Dr. Paxton displayed intelligence, excellent training and skill. His genial personality brought him a wide circle of friends, and his zeal and success in public service made him a valuable employe to the Bureau.

Dr. Paxton joined the A. V. M. A. in 1921.

The Gates open and a stranger wanders in.
A world of peace, devoid of strife and sin,
Unfolds before his vision newly born;
Eternal Life for him breaks into morn.

GEORGE W. PATTON

Dr. George W. Patton, of Bessemer, Ala., died March 19, 1925, of heart trouble. He was in his 71st year. He was a graduate of the Cincinnati Veterinary College, class of 1913, and was in practice with his son-in-law, Dr. Robert V. Hazlewood (Cin. '10). He leaves a widow, one daughter and two brothers.

GEORGE W. NEFF

Dr. George W. Neff, B. A. I. inspector-in-charge of tuberculosis eradication work in West Virginia, died suddenly at Charleston, on May 28, 1925, the cause being given as heart disease. He leaves a wife, also two children by a former marriage.

Dr. Neff was born in Indiana, July 29, 1876. He attended high school and the Indiana State Normal School for three years, following which he taught school for eight years. He first entered Bureau service as a tagger, in 1903, and was assigned at National Stock Yards, Illinois. He was transferred to Chicago the same year. He took up the study of veterinary medicine at the McKillip Veterinary College, and was graduated in 1906. He remained in the service as a veterinarian and served in various capacities.

Throughout his long career as a Bureau employee Dr. Neff's services were considered of a high type. He had a congenial personality, and this, together with square dealing, endeared him to all with whom he came in contact. In his official work he showed excellent judgment in his cooperation with state authorities, live stock owners and the general public. The Bureau feels the loss of a valuable representative.

Dr. Neff joined the A. V. M. A. in 1921.

The Master calls
And the servant faithful, true,
Hies to the summons
From the vale of doubts,
Fears and uncertainties.
He has earned to a higher realm
A transfer that no human hand revokes.

RALPH W. E. DANIELS

Dr. Ralph Waldo Emerson Daniels, of Hinsdale, Mass., died at his home, May 22, 1925, after a lingering illness.

Born in Toronto, Ont., August 8, 1896, Dr. Daniels received his veterinary training at the University of Pennsylvania, having been graduated with the class of 1921. He practiced in Boston, with Dr. Delano, and later in New York City, in connection with the Society for the Prevention of Cruelty to Animals.

Dr. Daniels leaves a widow, an infant son, his mother, father and one brother. He was a member of Alpha Psi Fraternity.

ANDREWS STRANGE

Dr. Andrews Strange, of 322 West 15th Street, New York, N. Y., died March 11, 1925. He was a graduate of the American Veterinary College, class of 1886. He joined the A. V. M. A. in 1887 and at the time of his death was among the oldest members on the roll, having enjoyed continuous membership for thirty-eight years.

JAMES G. PERRY

Dr. James G. Perry, of Ennis, Texas, is reported to have died several months ago. Further particulars are lacking. Dr. Perry was graduated from the Kansas City Veterinary College in 1909. He joined the A. V. M. A. in 1910.

THEODORE J. ROESCH

Dr. Theodore J. Roesch, of Cedarburg, Wis., died June 5, 1925, after an illness of eight weeks.

Born in Merton, Wis., September 7, 1879, he attended grade and high schools. He was a graduate of the Chicago Veterinary College, class of 1907, and practiced continuously at Cedarburg for eighteen years.

Dr. Roesch was a member of the Wisconsin Veterinary Medical Association. For many years he had been connected with the local Agricultural Society, having served as secretary and for the past two years as president. He was a member of the County Draft Board during the World War. He was a member of the Advancement Association, the Beavers' Lodge, and was secretary of the Masonic Lodge 320 F. and A. M.

He is survived by his widow, two daughters and two sisters.

MARRIAGES

Dr. John E. Sargeant (Chi. '20), of Fairbury, Ill., to Miss Glyda Gray, of Pontiac, Ill., May 11, 1925, at Chicago, Ill.

Dr. John Daniels, of Perry, Ill., to Miss Myrtle Oitker, of Barry, Ill., May 20, 1925, at East St. Louis, Ill.

BIRTHS

To Dr. and Mrs. S. Thomas Law, of Montpelier, Vt., a daughter, Gloria, May 10, 1925.

PERSONALS

Dr. W. J. Turnbull (Ont.'25) has located at Carman, Manitoba.

Dr. O. C. Lynch (Corn.'18) has removed from Mooresville to Statesville, N. C.

Dr. H. J. Watt (Ont. '17), of Killarney, Manitoba, sailed for Great Britain early in June.

Dr. Ray Gaskill (McK. '12) has changed locations from Wahpeton to Rugby, N. D.

Dr. A. W. Sutherland (Ont. '08) has removed from Bristol, Conn., to De Lancey, N. Y.

Dr. H. T. Carpenter (Ont. '88), of Detroit, Mich., has enlarged his small animal hospital.

Dr. W. J. Hinman (Ont. '85), of Winnipeg, Manitoba, was paddock judge at the Calgary races, May 25-30.

Dr. F. F. Saint (Ont. '18) has been transferred from Calgary to Winnipeg, Man. Address: 711 Boyd Bldg.

Dr. J. D. Whyte (Mont. '86), of Calgary, Alta., sailed for Great Britain, on the S. S. Manchester Hero, May 14.

Dr. C. L. Phillips (O. S. U. '19) has removed from New York City to Chattanooga, Tenn. Address: 1094 McCallie Ave.

Dr. D. F. Eggers (McK. '08) has changed his address from Oak Park, Ill., to 544 South Hawthorne Street, Elmhurst, Ill.

Dr. H. E. Kemper (K. C. V. C. '14) has removed from Carrizozo, N. Mex., to Phoenix, Arizona. Address: 300 Capitol Bldg.

Dr. Lewis H. Wright (Corn. '14) received the degree of Doctor of Medicine, at the recent commencement of the University of Georgia.

Dr. Cyril Mackie (Ont. '16), of Carman, Manitoba, sailed for Great Britain on the S. S. Salacia, May 23, to be gone about two months.

Dr. E. E. Patterson (Gr. Rap. '01), of Detroit, Mich., now has his son, Dr. J. E. Patterson (Ont. '25), associated with him in practice.

Dr. O. B. Neely (Iowa '24), formerly at Rockingham, N. C., has been appointed Caldwell County Veterinarian and is stationed at Lenoir, N. C.

Dr. E. Hanshew (N. Y.-Amer. '03), of Brooklyn, N. Y., has given up practice and is now residing at 145 Kilburn Road, Garden City, Long Island, N. Y.

Dr. F. J. Olbrich (Iowa '22), who has been located in Owtaonna, Minn., for about a year, is now in Philadelphia, Pa. Address: 1519 West Tucker Street.

Dr. G. P. Moyer (Chi. '16) is engaged in tuberculosis eradication in Marquette County, Upper Peninsula of Michigan. His address is: 526 Fisher Street, Marquette, Mich.

Dr. A. K. Zellner (Corn. '18) has resigned as chief veterinarian of the Dairymen's League Cooperative Association, Inc., of New York, and will engage in private practice at Oneida, N. Y.

Dr. W. Hilton (McK. '06), of Winnipeg, Manitoba, acted as official veterinarian at the 21-day running races held in Winnipeg in June, at the Whittier Park, River Park and Polo Park tracks.

Dr. W. C. Reeder (U. P. '12) has given up his practice at Elkton, Md., to accept a position with the Supplee-Wills-Jones Milk Company, as field veterinarian, with headquarters at Nassau, Delaware.

Drs. E. G. Folsom (Ont. '08) and O. C. Anderson (McK. '15), formerly assistants to the late Dr. S. Brenton, of Detroit, are carrying on the practice and conducting the Detroit Veterinary Sanitarium.

Dr. Norris L. Townsend (U. P. '99), B. A. I. inspector-in-charge of tuberculosis eradication in Kansas, will attend the Portland meeting. The trip will, in part, be a celebration of his silver wedding anniversary.

Dr. C. W. Eddy (O. S. U. '00), who has been Chief Veterinarian for the Telling-Belle Vernon Company, of Cleveland, Ohio, is reported to be heavily interested in the recently organized Montrose Dairy Company, of Akron, Ohio.

Dr. Daniel M. Purdy (K. S. A. C. '17) is now located at Lexington, Nebr. Since his return from California, on foot-and-mouth disease eradication, he has been transferred to the force of Dr. A. H. Francis, at Lincoln, on tuberculosis eradication.